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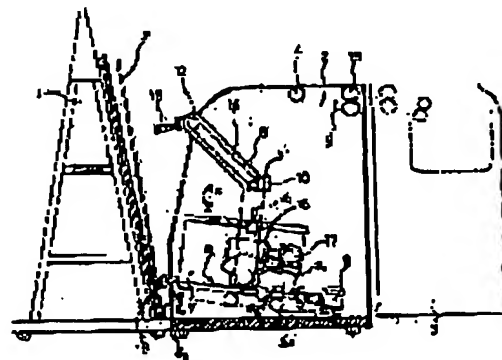
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(54) METHOD AND DEVICE FOR AUTOMATIC FEEDING OF PHOTOSENSITIVE PLATE

(57)Abstract:

PROBLEM TO BE SOLVED: To convey a second and subsequent photosensitive plates to a processing layer one by one securely under separate, sorted, and sucked conditions by making multiple sucking members in to contact with vicinity of the upper end of the uppermost layer plate of multiple photosensitive plates, and vibrating suction cup members or sucking them alternately by a suction cup located at the central part and end part of the member.

SOLUTION: When a movable cup 6 is oscillated together with a rotating shaft 12 at the tip of which a shaft is provide, and moved to the photosensitive plate P side, a motor 10 is started by a sensor S1, the turning shaft 12 is rotated through an endless belt 14, and suction cups 15 and 15 are sucked near the upper end of the photosensitive plate P. Also, the turning shaft 12 is rotated clockwise by the command from a control part 20, the suction cups 15 and 15 rise so as to move the photosensitive plate by a prescribed distance, and the motor 10, when touching the sensor, is rapidly switched over in reverse rotation, lowering the suction cups 15 and 15 suddenly, and the lower end edge of the photosensitive plate P is collided with the bottom plate of a loading table 1. This is repeated by the control of a control part 20 so as to peel off a second sheet and subsequent, and feed only one sheet under securely sucked condition.



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CLAIMS

[Claim(s)]

[Claim 1] In the automatic feeder of the sensitization plate for supplying the transport device which conveys this sensitization plate after imagewise exposure of the metallic sensitization plate which applied sensitive material to the processing tub which carries out development and fixing / rinsing processing from a laminating installation location Near the upper limit side of the non-exposing field of the sensitization plate of the maximum upper layer of two or more sensitization plates with which the magnitude [finishing / exposure (size) currently loaded into the installation base which counters the insertion side of said transport device, is arranged, and is made to come to incline a little differs [whether the adsorption member equipped with two or more suckers is mostly contacted to coincidence and this adsorption member is vibrated, and] And/or, with the separation **** means of the sensitization plate which the time of a suction effect is made different from each other, and is made to attract by turns with the sucker of a center section, and the sucker of an edge part, where separation **** and this sensitization plate are adsorbed, the sensitization plate of the 2nd [or less] sheet The automatic supply approach of the sensitization plate which is made to carry out a parallel displacement and is characterized for the movable arm equipped with this adsorption member by rotation or conveying only the sensitization plate of the maximum upper layer from an upper limit side to insertion opening of said processing tub.

[Claim 2] The automatic supply approach of a sensitization plate according to claim 1 that the separation **** means of the sensitization plate of the 2nd [or less] sheet of said adsorption member is characterized by giving an intermittent rotation operation of minimum distance round trip rotation to said adsorption member in accordance with the migration orbit of the adsorption side of the sucker of said adsorption member.

[Claim 3] The automatic supply approach of a sensitization plate according to claim 1 that the two-sheet separation **** means of said adsorption member is characterized by making said adsorption member give a minimum distance round trip oscillating operation perpendicularly to the adsorption side of the sucker of said adsorption member intermittently.

[Claim 4] The automatic supply approach of a sensitization plate according to claim 1 that the two-sheet separation **** means of said adsorption member can shift the time of a suction effect with the sucker of the central part of the sucker of said adsorption member, and the sucker of an edge, carries out contact suction, and is characterized by giving curvature deformation to the sensitization plate of the maximum upper layer, and making air flow between the sensitization plates of the 2nd [or less] sheet.

[Claim 5] Claims 1, 2, and 3 characterized by arranging a detection means to detect the magnitude of the sensitization plate of the maximum upper layer so that it can always stick to the size of a sensitization plate near the upper limit of a sensitization plate regardless of the adsorption location of the sensitization plate of the sucker of said adsorption member, or the automatic supply approach of a sensitization plate according to claim 4.

[Claim 6] Said detection means consists of two or more conductive terminals in contact with the rear face of a sensitization plate. One of them is a criteria conductivity terminal, and this criteria conductivity terminal is arranged so that it may contact near the lower limit center of a sensitization plate. The conductive terminal for die-length detection of another side sensitization plate is arranged in the location which contacts near the upper limit center of a sensitization plate. The conductive terminal for width-of-face detection of a sensitization plate is the automatic supply approach of the sensitization plate according to claim 1, 2, 3, 4, or 5 characterized by arranging more than one at intervals of predetermined crosswise near the sucker of said adsorption member, and detecting the die length and width of face of a sensitization plate.

[Claim 7] In the automatic feeder of the sensitization plate for supplying the transport device which conveys this sensitization plate after imagewise exposure of the metallic sensitization plate which applied sensitive material to the processing tub which carries out development and fixing / rinsing processing from a laminating installation location The installation base which counters the transport device conveyed to a processing tub, is made to incline a little, and carries out laminating installation of the sensitization plate [finishing / exposure], The adsorption member equipped with the sucker which contacts coincidence mostly near the upper limit side of the non-exposing field of the sensitization plate with which the magnitude (size) loaded into this installation base differs, It is connected at a tip through the connection member rotating around the rotation shaft which carried out at least two-piece horizontal juxtaposition of this adsorption member, and was fixed, and this rotation shaft, and has two or more location detection means to detect a rotational frequency or an angle of rotation. The interlocking lever which can be rotated freely, The truck which moves in the rail to which supported to revolve the lower limit of the movable arm which built in a connection member, said interlocking lever, etc. of said rotation shaft, enabling free rotation, was equipped with the rocking member which makes said movable arm rock focusing on this support part, and was laid at the pars basilaris ossis occipitalis. The 1st, 2nd, and 3rd driving means which carry out migration actuation of the attachment-and-detachment actuation by the side of a sensitization plate, and the truck of said rocking member for the movable arm by rotation actuation of the connection member rotating around said rotation shaft, and said rocking member, It consists of a control means which carries out sequential-control processing of the actuation of these 1st, 2nd, and 3rd driving means. While moving said truck, make said rocking member rock, and the rotation shaft at the tip of said movable arm is rotated. Suspend the sucker of said adsorption member in a predetermined location, rock said movable arm, and the sucker of said adsorption member is made to

contact the rear face of an exposed sensitization plate. The rear face near the upper limit of an exposed sensitization plate is adsorbed by the suction effect of this sucker. The automatic feeder of the sensitization plate characterized by rotating said rotation shaft, conveying the upper limit edge of a sensitization plate to insertion opening of a transport device, opening the adsorption member of said adsorption member wide, and conveying a sensitization plate to a processing tub after vibrating this adsorption member and performing two-sheet separation **** actuation.

[Claim 8] In the automatic feeder of the sensitization plate for supplying the transport device which conveys this sensitization plate after imagewise exposure of the metallic sensitization plate which applied sensitive material to the processing tub which carries out development and fixing / rinsing processing from a laminating installation location. The installation base which counter the transport device conveyed to a processing tub, and it is made to incline in the longwise direction a little, and carries out laminating installation of the sensitization plate [finishing / exposure]. The rocking member which supported pivotably for the other end of the movable arm which supported the axis end section of the rotation shaft which fixed at least two adsorption members equipped with the sucker which contacts coincidence mostly near the upper limit side of the non-exposing field of the sensitization plate with which the magnitude (size) loaded into this installation base differs in the truck, enabling free rotation, and has been arranged in a transport device. The 1st, 2nd, and 3rd driving means which carry out migration actuation of the attachment-and-detachment actuation by the side of a sensitization plate, and the truck of said rocking member for the movable arm by rotation actuation of said rotation shaft, and said rocking member. It consists of a control means which carries out sequential-control processing of the actuation of these 1st, 2nd, and 3rd driving means, and control processing is carried out by said control means by the detecting signal of the location detection prepared in said 1st, 2nd, and 3rd driving means. By said rocking member The sucker of the adsorption member fixed to the rotation shaft which was made to rock said movable arm and was established at the tip is contacted to the non-exposing field of a sensitization plate. The automatic feeder of the sensitization plate characterized by rotating a rotation shaft, moving a sensitization plate by the adsorption member, and conveying the upper limit edge of a sensitization plate to a processing tub side after vibrating an adsorption member or a sucker and performing a two-sheet separation **** operation.

[Claim 9] Said rocking member is made to rock by the 1st driving means which is one of said the driving means. Mostly the sucker of the adsorption member of the rotation shaft prepared in the upper limit free [rotation] to coincidence After making it contact near the upper limit side of the non-exposing field of the sensitization plate with which the length differs from magnitude on said installation base and adsorbing with a sucker. The 2nd driving means which is said driving means is controlled by control of said control means. Normal rotation (right) and an inversion (left) are made to carry out both-way rotation of said rotation shaft about twice [at least] so that the adsorbed sensitization plate margin inferior may carry out disjunction from a bottom plate. Make one-sheet separation actuation of a sensitization plate perform, next rotate a rotation shaft, turn the adsorption side of an adsorption member up, and a sensitization plate is leveled. The parallel displacement of said rocking member is made to carry out in the conveyance direction by the 3rd driving means which is said driving means. When inserted in the conveyance roller which conveyed said sensitization plate and the tip of this sensitization plate formed in the conveyance inlet port of a processing tub by the adsorption member fixed to the rotation shaft, Open the absorption of an adsorption member wide, rotate said rotation shaft rightward, and the sucker of an adsorption member is made to desert a sensitization plate. Convey a sensitization plate to a processing tub with said conveyance roller, and said rocking member is returned by the 3rd driving means during this conveyance at an initial valve position. The automatic feeder of the sensitization plate according to claim 8 characterized by controlling the 3rd driving means of a rocking member by said control means to prepare the next conveyance.

[Claim 10] The automatic feeder of the sensitization plate according to claim 7, 8, or 9 which carries out the description of contacting destaticization member to the rear-face full near the lower limit of this sensitization plate when said sensitization plate moves by rotation of an adsorption member.

[Claim 11] An endless band is laid between the gearing which prepared in the axis end of the rotation shaft of said rocking member, and the gearing of an oscillation member which prepared in the movable arm. A sensitization plate carries out right rotation of the rotation shaft with low-velocity in the conveyance direction of a sensitization plate, immediately after adsorbing by the adsorption member. The automatic feeder of the sensitization plate according to claim 8, 9, or 10 which is made to carry out swing-and-tilt movement, and is characterized by the thing which is made for this hard flow to carry out left rotation by whenever [rapid], and which come to control said two-sheet separation actuation by the oscillation member.

[Claim 12] The automatic feeder of the sensitization plate according to claim 7 characterized by the sucker which the adsorption member equipped with said sucker established the gas circulation way in the interior, built in the gas drive (air cylinder), and was prepared at the tip being perpendicularly movable to an adsorption side.

[Claim 13] The automatic feeder of the sensitization plate according to claim 7 or 12 characterized by arranging in each said 1st [of said rotation actuation, the attachment-and-detachment actuation to the sensitization plate by rocking of said movable arm and migration actuation of a truck], 2nd, and 3rd driving means a location detection means to detect the both-ends location of each actuation.

[Claim 14] Claim 7, the automatic feeder of the sensitization plate of 12 publications which are characterized by establishing a two-sheet separation **** means to vibrate this adsorption member and to sell the sensitization plate of the 2nd [or less] sheet after contacting the sucker of said adsorption member at the sensitization plate rear face of the maximum upper layer of a sensitization plate [finishing / the loading **** exposure on the installation base made to come to incline].

[Claim 15] Claims 7, 12, and 13 characterized by the two-sheet separation **** means of said adsorption member being what gives a minimum distance round trip oscillating operation intermittently to said adsorption member in accordance with the migration orbit of the adsorption side of the sucker of said adsorption member, or the automatic feeder of a sensitization plate given in 14.

[Claim 16] Claims 7 and 12 characterized by the two-sheet separation **** means of said adsorption member being the thing which makes said adsorption member give a minimum distance round trip oscillating operation perpendicularly to the adsorption side of the sucker of said adsorption member intermittently thru/or the automatic feeder of a sensitization plate given in 14.

[Claim 17] Where a sensitization plate is adsorbed, the sucker of said adsorption member is continuously moved perpendicularly to an adsorption side 2 to 3 times. Later, Claims 7 and 12 characterized by conveying only the sensitization plate of the maximum upper layer

certainly by stopping for several seconds, making air flow between the sensitization plates of the 2nd [or less] sheet, vibrating a sucker 2 to 3 times again, and repeating this thru/or 14, the automatic feeder of the sensitization plate of 16 publications.

[Claim 18] Claims 7 and 12 characterized by arranging a detection means to detect the magnitude of the sensitization plate of the maximum upper layer accumulated so that it could always stick to sensitization plate size near the upper limit of a sensitization plate regardless of the adsorption location of the sensitization plate of the sucker of said adsorption member thru/or the automatic feeder of a sensitization plate given in 17.

[Claim 19] Said detection means consists of two or more conductive terminals in contact with the rear face of a sensitization plate. A criteria conductivity terminal is arranged so that it may contact near the lower limit center of a sensitization plate. It is the automatic feeder of claims 7 and 12 characterized by arranging the conductive terminal for die-length detection so that it may contact near the upper limit center of a sensitization plate, and the conductive terminal for width-of-face detection of a sensitization plate consisting of what has been arranged crosswise near the sucker of said adsorption member thru/or a sensitization plate given in 18.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the automatic supply approach of the sensitization plate which can carry out automatic supply of the sensitization plate which put against the lengthwise direction or the longitudinal direction, and carried out the laminating into a processing tub certainly the whole sheet from an upper limit side, and its equipment.

[0002]

[Description of the Prior Art] When conveying continuously the sensitive material for printing which applied sensitive material to the metal plate to the processor which processing tubs, such as a developer, arranged and processing it to it, it connects with this processor and many automatic feeders of a sensitization plate are used. The sensitization plate of these metallicity is large, carries out laminating installation of the sensitization plate [finishing / exposure on an installation base / generally since there is weight] horizontally, and is made to transport it to conveyance opening of a processor using ****, a sucker, etc. which pinch the tip of one sheet of this maximum upper layer. Moreover, the installation base which lays two or more photosensitive plates in a lengthwise direction is connected with the transport device of a sensitization plate as indicated by JP,63-171128,A. Establish the support means which supports the lower limit of the sensitization plate which countered this installation base and has been arranged, and the lower limit of one sheet of the maximum upper layer of said sensitization plate is adsorbed with an adhesive disk. Make the hook prepared in said supporter material pinch, and migration installation of the photosensitive plate is carried out by the climb motion of this hook at supporter material. What conveys that upper limit to a processor is known making an exfoliation member intervene between this supporter material and the following sensitization plate, raising supporter material, and pressing the lower limit of a sensitization plate.

[0003]

[Problem(s) to be Solved by the Invention] However, in order to lay a big sensitization plate horizontally in what carries out installation storage of said sensitization plate horizontally, the big installation tooth space was needed. Moreover, the configuration was complicated to the whole, such as it not only needing the exfoliation member of a device complicated in order to adsorb with a sucker the lower limit of the sensitization plate which carried out laminating arrangement in said lengthwise direction, but it being necessary to make different migration actuation of two or more suckers, in order to ensure separation with the sensitization plate of the 2nd sheet, and making a migration member intervene between sensitization plates further, and ensuring segregation. The technical problem of this invention offers the automatic supply approach of a sensitization plate that near the upper limit of the sensitization plate which carries out the laminating to the lengthwise direction or the longitudinal direction can be adsorbed with an adhesive disk, and a sensitization plate can be simply conveyed from an upper limit side to a transport device. Other technical problems of this invention do not need the grasping member which pinches the sensitization plate which carried out the laminating, but the automatic feeder of the sensitization plate which can supply the sensitization plate of the maximum upper layer for every sheet certainly by the simple device is offered.

[0004]

[Means for Solving the Problem] After the imagewise exposure of a metallic sensitization plate said whose technical problem of this invention applied sensitive material, in the automatic feeder of the sensitization plate for supplying the transport device which convey this sensitization plate to the processing tub which carries out development and fixing / rinsing processing from a laminating installation location near the upper limit side of the non-exposing field of the sensitization plate of the maximum upper layer of two or more sensitization plates with which the magnitude [finishing / exposure] (size) currently loaded into the installation base which counters the insertion side of said transport device, is arranged, and is made to come to incline a little differs [whether the adsorption member equipped with two or more suckers is mostly contacted to coincidence, and this adsorption member is vibrated, and] And/or, with the separation **** means of the sensitization plate which the time of a suction effect is made different from each other, and is made to attract by turns with the sucker of a center section, and the sucker of an edge part, where separation **** and this sensitization plate are adsorbed, the sensitization plate of the 2nd [or less] sheet. The movable arm equipped with this adsorption member can be attained by rotation or the automatic supply approach of a sensitization plate of carrying out a parallel displacement and conveying on the sensitization plate of the maximum upper layer from an upper limit side to insertion opening of said processing tub.

[0005] The installation base which counters the insertion side of said transport device, is arranged, is made to incline a little, and carries out laminating installation of the sensitization plate [finishing / exposure]. The adsorption member equipped with the sucker which contacts coincidence mostly near the upper limit side of the non-exposing field of the sensitization plate with which the magnitude (size) loaded into this installation base differs. It is connected at a tip through the connection member rotating around the rotation shaft which carried out at least two-piece horizontal juxtaposition of this adsorption member, and was fixed, and this rotation shaft, and has two or more location detection means to detect a rotational frequency. The interlocking lever which can be rotated freely, The truck which moves in the rail top which supported to revolve the lower limit of the movable arm which built in a connection member, said interlocking lever, etc. of said rotation shaft, enabling free rotation, was equipped with the rocking member which makes said movable arm rock focusing on this support part, and was laid at the pars basilaris ossis occipitalis, The 1st, 2nd, and 3rd driving

means which carry out migration actuation of the attachment-and-detachment actuation by the side of a sensitization plate, and the truck of said rocking member for rotation actuation of the connection member rotating around said rotation shaft, and said rocking member, While consisting of a control means which carries out sequential-control processing of the actuation of these driving means and moving said truck by said 3rd driving means, said rocking member is made to rock by the 2nd driving means. Rotate the rotation shaft at the tip of said movable arm by the 1st driving means, and the sucker of said adsorption member is suspended in a predetermined location. Rock said movable arm and the sucker of said adsorption member is made to contact the rear face of an exposed sensitization plate. After performing two-sheet separation **** actuation by separation **** means to adsorb the rear face near the upper limit of an exposed sensitization plate, and to vibrate this adsorption member with this sucker, Said rotation shaft is rotated, the upper limit of a sensitization plate is conveyed to insertion opening of a transport device, the adsorption member of said adsorption member is opened wide, and it can attain by conveying a sensitization plate to a processing tub.

[0006] The installation base which counter the transport device conveyed to a processing tub, and it is made to incline in the longwise direction a little, and carries out laminating installation of the sensitization plate [finishing / exposure], The rocking member which supported pivotably for the other end of the movable arm which supported the axis end section of the rotation shaft which fixed at least two adsorption members equipped with the sucker which contacts coincidence mostly near the upper limit side of the non-exposing field of the sensitization plate with which the magnitude (size) loaded into this installation base differs in the truck, enabling free rotation, and has been arranged in a transport device. Each 1st [which carries out migration actuation of the attachment-and-detachment actuation by the side of a sensitization plate, and the truck of said rocking member for rotation actuation of said rotation shaft, and said rocking member], 2nd, and 3rd driving means, By said rocking member by said control means control processing is carried out and according to said 3rd driving means by the detecting signal of the location detection which consisted of a control means which carries out sequential-control processing of the actuation of each of this driving means, and was prepared in said each driving means The sucker of the adsorption member fixed to the rotation shaft which was made to rock said movable arm and was established at the tip is contacted to the non-exposing field of a sensitization plate. After vibrating an adsorption member and performing a two-sheet separation **** operation, a rotation shaft is rotated, a sensitization plate is moved by the adsorption member and the configuration which conveys a sensitization plate to a processing tub side can attain.

[0007] Separate and sell the sensitization plate of the 2nd [or less] sheet of the sensitization plate of the maximum upper layer by which the sucker was adsorbed, and it sets for a means. After considering as the oscillating approach of said adsorption member and performing both-way vibration perpendicularly for a sucker several times to an adsorption side, Stop this oscillating operation for several seconds, air is made to flow between the sensitization plates of the 2nd [or less] sheet in the meantime, and said technical problem can be attained also by dissociating certainly and conveying one sensitization plate certainly by making it vibrate again.

[0008] Mostly the sucker of the adsorption member of the rotation shaft which was made to rock said rocking member by the first driving means, and prepared it in the upper limit free [rotation] moreover, to coincidence After making it contact near the upper limit side of the non-exposing field of the sensitization plate with which die length differs from magnitude on said installation base and adsorbing with a sucker, Normal rotation (right) and an inversion (left) are made to carry out both-way rotation of said rotation shaft about twice [at least] so that the 2nd driving means may be controlled by control of said control means and the adsorbed sensitization plate margo inferior may carry out disjunction from a bottom plate. Make one-sheet separation actuation of a sensitization plate perform, next rotate a rotation shaft, turn the adsorption side of an adsorption member up, and a sensitization plate is leveled. When the parallel displacement of said rocking member is made to carry out in the conveyance direction by the 3rd driving means, said sensitization plate is conveyed by the adsorption member fixed to the rotation shaft and the tip of this sensitization plate is inserted in the conveyance roller formed in the conveyance inlet port of a processing tub, Open the absorption of an adsorption member wide, rotate said rotation shaft to right wandering, and the sucker of an adsorption member is made to desert a sensitization plate. With said conveyance roller A sensitization plate is conveyed to a processing tub, said rocking member is returned by the 3rd driving means during this conveyance at an initial valve position, and the configuration which controls the 3rd driving means of a rocking member by said control means to prepare the next conveyance can attain said technical problem.

[0009] Furthermore, the time of a suction effect can be shifted with the sucker of a central part, and the sucker of an edge part among the suckers of two or more adsorption members, curvature deformation can be given to a sensitization plate, air can be made to be able to flow between the sensitization plates of the 2nd [or less] sheet, and separation **** can also be performed certainly. It detects, the die length of a sensitization plate, and the magnitude (size) of breadth — a detection means — Said movable arm is made to rock by moving said truck to an installation base and processing tub side. As the location of the sucker of said adsorption member moved and it is made to adsorb near the upper limit of the non-exposing field of various sensitization plates, by one transport device, many one sensitization plate can be conveyed certainly and said technical problem can be attained.

[0010] It arranges so that a criteria conductivity terminal may be contacted near the lower limit center of a sensitization plate as a detection means of said size of this sensitization plate. When the conductive terminal which detects die length is arranged so that it may contact near the upper limit center of the longest sensitization plate, and the conductivity of the electrical and electric equipment between both the conductivity terminals of these upper and lower sides is accepted Make the location near an installation base side stop the location of said truck, and said movable arm is rocked. The adsorption member arranged in a part for the point of this movable arm can be made to be able to adsorb near the upper limit of the sensitization plate of an oversized class, and the tip of a sensitization plate can be inserted in the conveyance inlet port of a processing tub by rotation of an adsorption member, rocking of a movable arm and migration of a truck. Moreover, when a flow is not accepted between both up-and-down conductivity terminals, said truck is moved to a processing tub side, a movable arm is made to rock, an adsorption member can be made to be able to adsorb near the upper limit of the sensitization plate of the class of short eye, a movable arm can be moved like the above-mentioned, and a sensitization plate can be conveyed.

[0011]

[Embodiment of the Invention] Since the automatic feeder (a following autofeeder is called) of the sensitization plate of this invention does not lay an exposed sensitization plate horizontally, but put in a lengthwise direction or a longitudinal direction on an installation

base, carry out laminating installation, coincidence is made to adsorb two or more adsorption member to near the upper limit of the rear face of this sensitization plate mostly, an upper limit edge is carried out at a tip for a sensitization plate and it is made to move, it becomes that two-sheet separation is certainly possible by the following separation mechanisms. For example, since make right and left carry out both-way rotation of the rotation shaft fixed to revolve at the tip of a rocking member about twice [at least], said adsorption member is made to go up and down and swing-and-tilt actuation is performed, separation of a sensitization plate is certainly possible, and since the tip of a sensitization plate is leveled in the condition of having adsorbed by the adsorption member, separation with the sensitization plate of the 2nd [or less] sheet can carry out easily.

[0012] Moreover, since a sensitization plate can be moved to the conveyance inlet port of a processing tub only by rotating the rotation shaft which fixed the adsorption member, the tip of a sensitization plate can be certainly conveyed to a conveyance inlet port. And a sensitization plate is conveyed with a conveyance roll and an adsorption member is evacuated from a sensitization plate side at this time. A sensitization plate is transported with a conveyance roller, by the RLC of a rotation shaft, an adsorption-after predetermined time member moves to a sensitization plate side, and a rotation shaft carries out return rotation and it returns to origin in a location. Thus, since it is constituted, the conveyance activity of a sensitization plate will operate efficiently. Furthermore, when conveying a sensitization plate by the adsorption member, failures, such as generating of static electricity by friction of a sensitization plate comrade, can be prevented by contacting an electric discharge member on a sensitization plate.

[0013] Since the criteria conductivity terminal in contact with the conductive metal plate of the rear face of a sensitization plate is arranged as a detection means of the magnitude (size) of the sensitization plate of this invention, a destaticization member is not needed. Moreover, near the upper limit of a sensitization plate can be made to adsorb certainly by the adsorption member of a movable arm regardless of the magnitude of many kinds of sizes by adjusting the adsorption location of a sucker by detecting the size of a sensitization plate with said size detection means.

[0014] Drawing 1 is the important section partial cross-section side elevation of the transport device equipped with the automatic feeder of the 1st example of the sensitization plate concerning this invention. Drawing 2 is the top view of drawing 1. Drawing 3 is the expansion important section cross-section side elevation of the automatic feeder of the 1st example. Drawing 4 is the explanatory view of the oscillation device of the rocking member of the automatic feeder of the 1st example, and is a sensitization plate separation actuation explanatory view. Drawing 5 is the migration explanatory view of the sensitization plate of this invention, and a rocking member. Drawing 6 is the important section cross-section side elevation of the automatic feeder of the 2nd example of this invention, and drawing 7 is the adsorption member of the 2nd example of this invention and the important section side elevation (A) of a movable arm, and a top view (B). Drawing 8 is the side elevation showing the adsorption member in the up location of the 2nd example of this invention, and the migration locus of a movable arm. Drawing 9 is the side elevation showing the adsorption member in the lower location of drawing 8, and the migration locus of a movable arm. Drawing 10 is the explanatory view of the size detection means of the automatic feeder of this invention, (A) is the side elevation of an installation base and (B) is a top view. Drawing 11 is the flow chart Fig. of the automatic supply approach of this invention.

[0015] The automatic feeder (autofeeder) of this invention is explained based on the 1st example shown in a drawing. 1 is the installation base which established the inclined plane which can put the sensitization plate P which has applied sensitive material on the surface of the metal plate against a lengthwise direction or a longitudinal direction, and can carry out laminating installation in both sides, and this grade is about 10 to 15 degrees. 2 is the transport device which adjoined the processing tub 3 of the sensitization plate P, and has been arranged, arranges two or more guide idlers 4 in upper leather, and has arranged the nip roller 19 of a pair in the location which countered insertion opening of the processing tub 3. The detection sensor 5 of the sensitization plate P is installed near this nip roller 19. 6 is the movable arm of a rocking member, this lower limit 6a is supported pivotably by the truck 7, this truck 7 is driven with the electric motor 8 which is the 3rd driving means, and the screw slot which gears with the ball shaft 9 which this electric motor 8 connected is established in the truck 7. The intermediate gear 11 of the motor 10 which is the 2nd driving means which is an oscillation member is arranged at the interstitial segment of this movable arm 6. The rotation shaft 12 is supported to revolve by the upper limit section of the movable arm 6, and an endless band 14 like a chain chain is laid between the intermediate gears 11 of the movable arm 6 of the gearing 13 of the axis end of this rotation shaft 12.

[0016] Two or more fixing of the sucker 15 and 15- which are the adsorption member which contacts this rotation shaft 12 at the rear face of the sensitization plate P is carried out, and the siphon is connected to this sucker 15 and 15-, respectively. 16 makes the movable arm 16 rock to an installation base 1 or nip roller 19 side with the drive motor 17 which is the flabellate form gearing for rocking which fixed at the end of the movable arm 6, and is the 1st driving means which has the screw shaft which gears with this gearing 16 for rocking. This rocking range can check each halt location among sensors S1 and S2. 18 is a destaticization brush, and if the sensitization plate P carries out migration initiation, it will contact full [of the sensitization plate P]. 20 is the control section which controls the drive of a motor 10, an electric motor 8, and drive-motor 17 grade, and sensors S1-S8 are arranged in the critical point of each actuation near the movable arm 6, the rotation shaft 11, and the gearing 16 for rocking.

[0017] The 2nd example of this invention is explained based on the drawing below drawing 8. As shown in drawing 6, the sucker 15 or an adsorption member was connected to the rotation shaft 12 through the siphon, and bevel-gear 24a of the interlocking shaft 24 which is a connection member has geared with bevel-gear 12a of this rotation shaft 12. Detection means S5 and S8 to detect this angle of rotation are installed in this interlocking shaft 24. The rotation location of a sucker 15 is regulated by these detection means S5 and S8. The end of this interlocking shaft 24 is connected with the motor 10 which is the 1st driving means. The end is supported to revolve by the truck 7 and, as for the movable arm 6, this truck 7 moves in a rail top with the electric motor 8 which is the 3rd driving means. As for the location of this truck 7, location detection is performed by sensors S7 and S8. When the criteria conductivity terminal 21 which is a detection means about the magnitude (size) of the sensitization plate P on the installation base 1 is contacted near the lower part of the sensitization plate P and the conductive terminal 22 for die-length detection contacts near an up center with the signal from a control section 20, this truck 7 detects the flow between both-ends children, and detects the die length of a sensitization plate.

[0018] Consequently, you move the location of a truck 7 to the installation base 1 or processing tub 3 side, and it is made for the

location of an adsorption member to be located near the upper limit of a sensitization plate, and a sucker 15 is made to contact the sensitization plate P, and is made to adsorb by the suction effect. The magnitude of the breadth of the sensitization plate P makes the conductive terminal 23 and 23- which have been arranged crosswise at intervals of predetermined contact the sensitization plate P, and measures the die length of breadth by the criteria conductivity terminal 21, the conductive terminal 23 which has flowed, and 23-. Do not operate the sucker 15 of the part which has not flowed, the suckers 15 and 15- which have flowed, i.e., sucker 15 in contact with sensitization plate P of the maximum upper layer -, are made to act, and it is made to adsorb.

[0019] For example, when the flow between the conductive terminals 22 and the criteria conductivity terminals 21 which are in contact with the sensitization plate P is checked. Based on the command of a control section 20, rotate an electric motor 8, and a truck 7 is moved to the halt location by the side of the installation base 1 (refer to drawing 8). With the drive motor 17 which is the 2nd driving means, about the movable arm 6, rotate the interlocking shaft 24 and the rotation shaft 12 is rotated. Make the sucker 15 at the tip of an adsorption member contact the non-exposing field of the sensitization plate P, it is made to adsorb, and the multiple-times reciprocating motion of this sucker 15 is made to carry out perpendicularly according to an operation of an air cylinder to an adsorption side. This count is set as arbitration with the thickness of the sensitization plate P. An end halt of this reciprocating motion is carried out, and air is made to flow between the sensitization plate P of the maximum upper layer, and the sensitization plate P of the 2nd [or less] sheet. Next, a sucker 15 is made to reciprocate again and it once stops. This is repeated about several times, an adsorption member is rotated, and the sensitization plate P is conveyed to a horizontal position parallel to a floor line. A truck 7 is moved to the processing tub 3 side on a rail with an electric motor 8, and when the tip edge of the sensitization plate P passes the detection sensor 5 and is pinched by the nip roll 19, the suction effect of a sucker 15 is opened wide and descends. It moves from a truck 7 to an initial valve position at return and the following conveyance attitude.

[0020] Actuation of the aut feeder of this invention is explained. According to the 1st example shown in drawing 1, imagewise exposure processing is carried out by an aligner etc., and the sensitization plate P which applied sensitive material to the front face of metal plates, such as aluminum, zinc, and copper, puts the sensitization plate P of predetermined size [finishing / this exposure] on the installation base 1 at a lengthwise direction, and has carried out the laminating. The thing of various magnitude is used and, generally, as for this sensitization plate P, the sensitization plate P of size with which difference is carried out is used. Therefore, two or more sensitization plates with which sizes differ are laid in the installation base 1. If the main switch of a transport device 2 is turned on, the installation base 1 will check that it is in a predetermined location by the sensor S8 formed in the lower limit of a transport device 2. Next, if it is checked that the location of a truck 7 is detected, a drive motor 17 operates, the gearing 16 for rocking rotates counterclockwise and the upper limit of the movable arm 6 rocks to the rear-face side of the sensitization plate P by the sensor S7 (sensor S1 check), the rotation shaft 12 which ****(ed) at the tip of this movable arm 6 will move to the sensitization plate P side. The motor 10 which is the 2nd driving means starts, it rotates until an intermediate gear 11 is detected by the sensor S6, the rotation shaft 12 rotates through the endless band 14 and a gearing 13, and the sucker 15 of an adsorption member and 15- contact near the rear-face upper limit of the sensitization plate P by the suction effect, and it adsorbs.

[0021] A motor 10 starts by the command of a control section 20, an intermediate gear 11 reverses and rotates, drawing 2 rotates [the rotation shaft 12] slowly clockwise, a sucker 15 and 15- go up, and the sensitization plate P transports. If the predetermined distance sensitization plate P moves and the sensor S5 of an intermediate gear 11 is contacted, it will reverse quickly and a motor 10 will drop a sucker 15 and 15- rapidly. The lower limit edge of the sensitization plate P is made to collide with the bottom plate of the installation base 1. This reciprocating motion is repeated several times and one sensitization plate P is made to stick to a sucker 15 and 15- certainly by control of a control section 20. At this time, a cam rotor plate may be fixed on the rotation shaft 12, rotation of the rotation shaft 12 may strike the rear face of the sensitization plate P, it may strike intermittently, an oscillating operation may be given, and vibration may be given to the sensitization plate P. Adsorption of the sensitization plate P of the 2nd [or less] sheet can be certainly exfoliated by this. **** of the sensitization plate P is performed, one sheet adsorbs by the sucker 15 and 15- certainly, if the neck swing actuation is completed, a motor 10 will rotate with the signal of a control section 20, drawing 2 will rotate the rotation shaft 12 clockwise through the endless band 14, a sucker 15 and the adsorption side of 15- become upward, and a part for the point of the sensitization plate P is leveled.

[0022] An electric motor 8 starts by the command of a control section 20, predetermined distance migration is carried out at the processing tub 3 side (in a control section 20, setting modification to arbitration is possible for this distance.), it dissociates with the 2nd [or less] sheet of the sensitization plate P, and the sensitization plate P moves a truck 7 to the nip roller 19 by the side of the processing tub 3.

[0023] At this time, the destaticization brush 18 contacts near a lower limit covering full [of the sensitization plate P]. A truck 7 is moved to a predetermined part with an electric motor 8, and it stops by the detection sensor. A drive motor 17 starts, through the gearing 16 for rocking, the upper limit of the movable arm 6 deserts the installation base 1, and the rotation shaft 12 carries out horizontal migration. When a sucker 15 and 15- also moved in the state of facing up, and the sensitization plate P was transported, it goes on until the tip of the sensitization plate P was fastened to the nip roller 19 through the guide idler 4, and the sensitization plate reaches a nip roller 19. A motor 10 operates at the same time the suction effect of a sucker 15 and 15- is opened wide, the rotation shaft 12 rotates further clockwise through an intermediate gear 11, the endless band 14, and gearing 13 grade, a sucker 15 and 15- evacuate from a sensitization plate side, and it stops in a predetermined location. By the electric motor 8, a truck 7 moves to the processing tub 3 side, and the tip of the sensitization plate P is conveyed to the processing tub 3.

[0024] If predetermined distance conveyance (it detects by a timer etc.) of the sensitization plate P is carried out, a drive motor 17 operates, return and a motor 10 will be reversed to an initial valve position, the rotation shaft 12 will rotate counterclockwise through an intermediate gear 11, the endless band 14, and gearing 13 grade, a sucker 15 and 15- will move to the sensitization plate P side, a the movable arm 6 and the rotation shaft 12 will return to an initial valve position. And supply actuation of the following sensitization plate P is performed.

[0025] Based on drawing 8 and drawing 9, actuation is explained about the 2nd example of the aut feeder of this invention. If the main switch of a transport device 2 is turned on, the criteria conductivity terminal 21 which is a size detection means as shown in drawing

10 (A) and (B), the conductive terminal 22 and the conductive terminal 23, and 23- will contact the conductive metal plate of the rear face of the sensitization plate P on the installation base 1. A control section 20 distinguishes by the conductive terminal 22 which flows between the criteria conductivity terminals 21 or the conductive terminal 23, and 23-, and the size of the sensitization plate P is detected. For example, when the conductive terminal 22 has flowed with the criteria conductivity terminal 21, it distinguishes that the sensitization plate P of the maximum upper layer is large size. If a truck 7 moves, approach the installation base 1 by the command of a control section 20, and it is arranged based on this detecting signal, and a drive motor 17 operates, the gearing 16 for rocking is rotated and the upper limit of the movable arm 6 rocks to the rear-face side of the sensitization plate P (sensor S1 check), the rotation shaft 12 which ****(ed) at the tip of this movable arm 6 will move to the sensitization plate P side.

[0026] The motor 10 which is the 2nd driving means starts, it rotates until the interlocking shaft 24 is detected by the sensor S6. the rotation shaft 12 rotates through bevel-gear 24a and bevel-gear 12a, and the sucker 15 of an adsorption member and 15- contact near the rear-face upper limit of the sensitization plate P by the suction effect, and it adsorbs. A sucker 15 and 15- reciprocate 2 to 3 times perpendicularly to an adsorption side by the air cylinder of an adsorption member, vibrate the sensitization plate P of the maximum upper layer, air is made to flow between the sensitization plates P of the 2nd [or less] sheet, and vibration is suspended. After several seconds, it is made to vibrate again and a two-sheet separation **** operation is ensured. An adsorption member rotates, the sensitization plate P to which the movable arm 6 rocked and it stuck is conveyed up, a truck 7 is moved and a nip roller 19 is made to pinch the tip of the sensitization plate P with an electric motor 8.

[0027] In the magnitude detection means of the above-mentioned sensitization plate P, when the criteria conductivity terminal 21 and the conductive terminal 22 have not flowed it is distinguished that it is the one where the size of the sensitization plate P is smaller, an electric motor 8 starts by the command of a control section 20, and predetermined distance migration of the truck 7 is carried out at the processing tub 3 side (in a control section 20, setting modification to arbitration is possible for this distance.). The movable arm 6 is rocked according to a rocking operation, drops the sucker 15 of an adsorption member, and 15- near the upper limit of the short range of the sensitization plate P, and is made to contact it (refer to drawing 9). In this location, the conductivity of the conductive terminal 23 arranged crosswise and 23- is distinguished, and the crosswise die length is detected. When the conductive terminals 23 and 23 for both ends have not flowed, suction actuation of the suckers 15 and 15 of this part can be suspended, and when only a central part operates a sucker 15, a useless suction effect can be eliminated. A sucker 15 and 15- are perpendicularly vibrated like the above-mentioned case, and it is a deed about two-sheet separation **** actuation. While making the movable arm 6 rock, moving a truck 7 to the installation base 1 side for a while, the rotation shaft 12 is rotated, an adsorption member is rotated, the sensitization plate P is made into a horizontal position, a truck 7 is moved to the processing tub 3 side, and a nip roller 19 is made to pinch the tip of the sensitization plate P. A sucker 15 and 15- are opened wide and a suction effect descends perpendicularly. The movable arm 6 returns to an initial valve position.

[0028] At this time, a cam rotor plate may be fixed on the rotation shaft 12, rotation of the rotation shaft 12 may strike the rear face of the sensitization plate P, it may strike intermittently, an oscillating operation may be given, and vibration may be given to the sensitization plate P. Adsorption of the sensitization plate P of the 2nd [or less] sheet can be certainly exfoliated by this.

[0029]

[Example] Since it is to adsorb near the upper limit of a sensitization plate, the autoseeder of this invention of the ability to design so that upper limit can be adsorbed correctly is natural by adjusting the location of a movable arm and a support lever, when supplying that from which the size of a sensitization plate is sharply different. For example, by detecting the magnitude of the sensitization plate P like the 2nd example, a location can be changed into the sucker of an adsorption member and many kinds of sensitization plates can be conveyed. As detection equipment which detects the magnitude of this sensitization plate, although two or more conductive terminals are used, it is not necessary to install a terminal separately by forming the sucker of an adsorption member by the conductive matter as this conductive terminal. For example, a sucker 15 and 15- can be used as the crosswise conductive terminal 23 and 23-.

[0030] Although the sucker of an adsorption member is carrying out three-piece adoption arrangement at intervals of predetermined in the autoseeder of this invention, this number is not limited to this, moreover, the two-sheet separation activity after adsorbing a sensitization plate with a sucker — beginning — updrift — slow speed — carrying out — downward migration — rapid — carrying out — this — about at least 2 times — both-way migration — a line — although things are good, this count can carry out a design change to arbitration according to the quality of the material of a sensitization plate.

[0031] In the autoseeder of this invention, by the ability shifting in time the suction effect of the sucker of the adsorption member arranged at intervals of predetermined at the horizontal single tier, curvature deformation can be given to a sensitization plate, air can be made to be able to flow between sensitization plates, and segregation can also be certainly performed by the two-sheet separator mechanism of the sensitization plate loaded into the installation base.

[0032]

[Effect of the Invention] As mentioned above, since the automatic supply approach of the sensitization plate this invention adsorbs near the upper limit of a sensitization plate with a sucker, it can convey the tip of a sensitization plate to a transport device certainly by the simple device, and moreover, it can convey one sensitization plate certainly according to the two-sheet separation **** operation by the adsorption member. Sucker actuation can perform simply as this two-sheet separation **** means.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the important section partial cross-section side elevation of the transport device equipped with the automatic feeder of the sensitization plate concerning this invention.

[Drawing 2] It is the top view of the automatic feeder of this invention.

[Drawing 3] It is the important section cross-section side elevation of this invention automatic feeder.

[Drawing 4] With the explanatory view of the oscillation device of the rocking member of the automatic feeder of this invention, it is a sensitization plate separation actuation explanatory view.

[Drawing 5] It is the migration explanatory view of the sensitization plate of this invention, and a rocking member.

[Drawing 6] It is the important section cross-section side elevation of the 2nd example of the automatic feeder of this invention.

[Drawing 7] They are the adsorption member of the 2nd example of this invention and the side elevation (A) of a movable arm, and a top view (B).

[Drawing 8] It is the side elevation showing the adsorption member in the up location of the 2nd example of this invention, and the migration locus of a movable arm.

[Drawing 9] It is the side elevation showing the adsorption member in the lower location of drawing 8, and the migration locus of a movable arm.

[Drawing 10] It is the explanatory view of the size detection means of the automatic feeder of this invention.

[Drawing 11] It is the flow chart Fig. of the automatic supply approach of this invention.

[Description of Notations]

- 1 — Installation Base
- 2 — Transport Device
- 3 — Processing Tub
- 4 — Guide Idler
- 5 — Detection Sensor
- 6 — Movable Arm
- 7 — Truck
- 8 — Electric Motor
- 9 — Ball Shaft
- 10 — Motor
- 11 — Intermediate Gear
- 12 — Rotation Shaft
- 13 — Gearing
- 14 — Endless Band
- 15 — Sucker
- 16 — Gearing for Rocking
- 17 — Drive Motor
- 18 — Destaticization Brush
- 19 — Nip Roller
- 20 — Control Section
- 21 — Criteria Conductivity Terminal
- 22 — Conductive Terminal (for Die-Length Detection)
- 23 — Conductive Terminal (for Breadth Detection)
- 24 — Interlocking Shaft

[Translation done.]

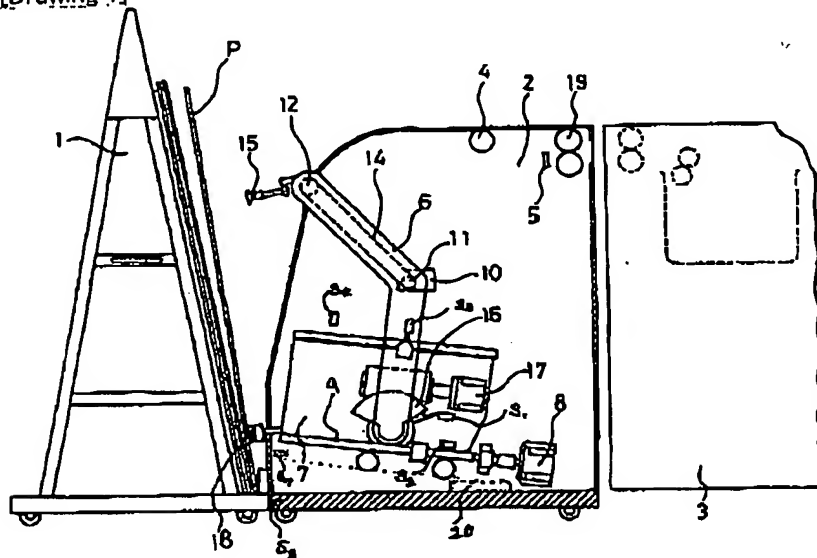
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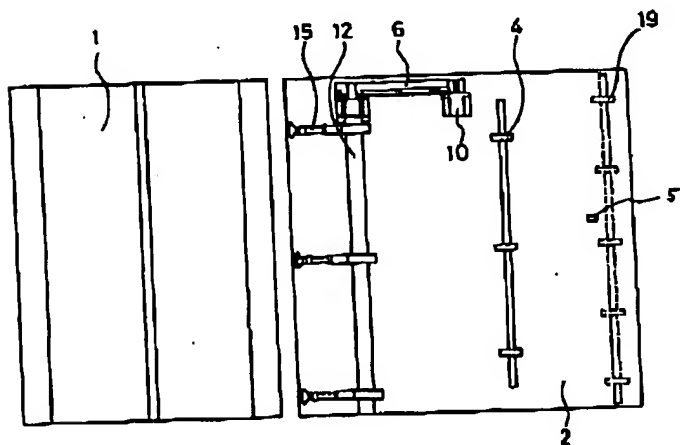
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DRAWINGS

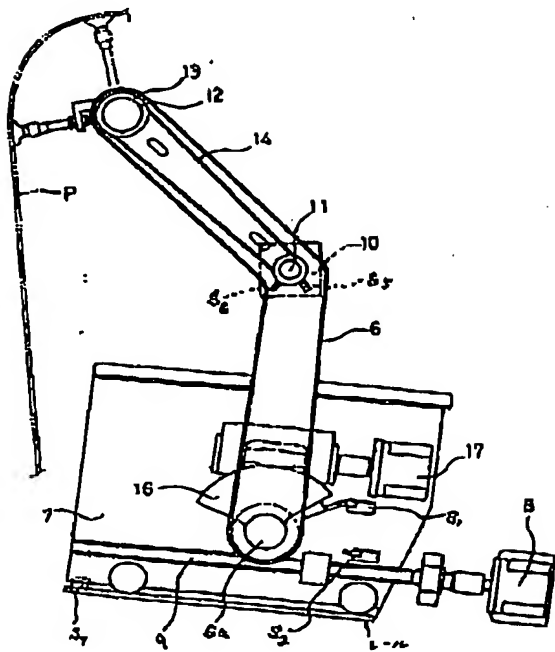
[Drawing 1]



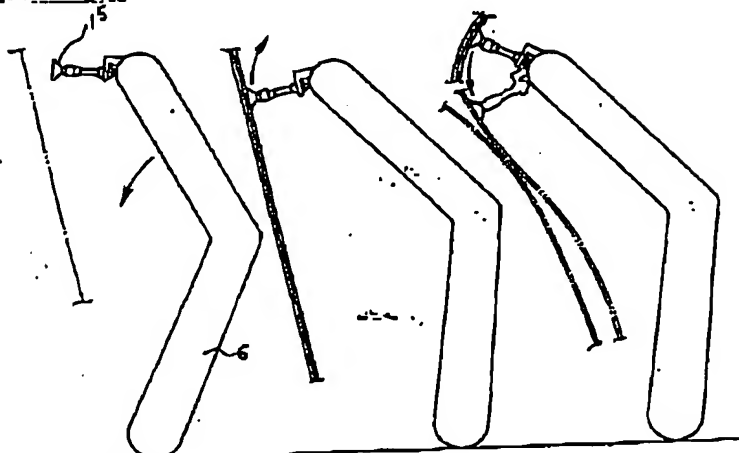
[Drawing 2]



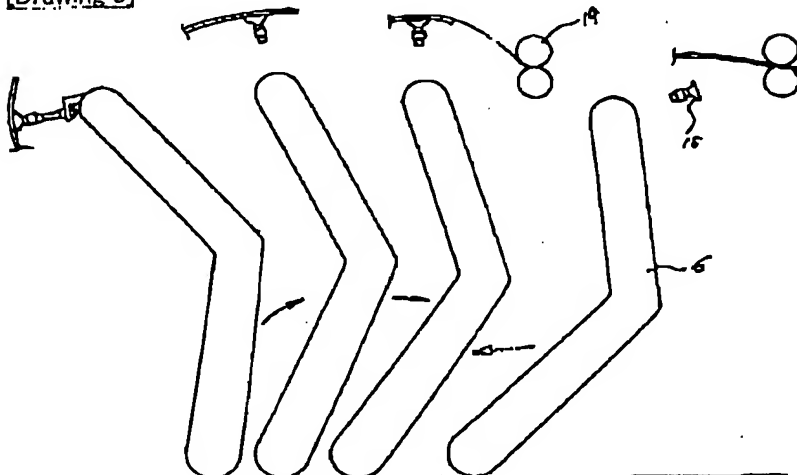
[Drawing 3]



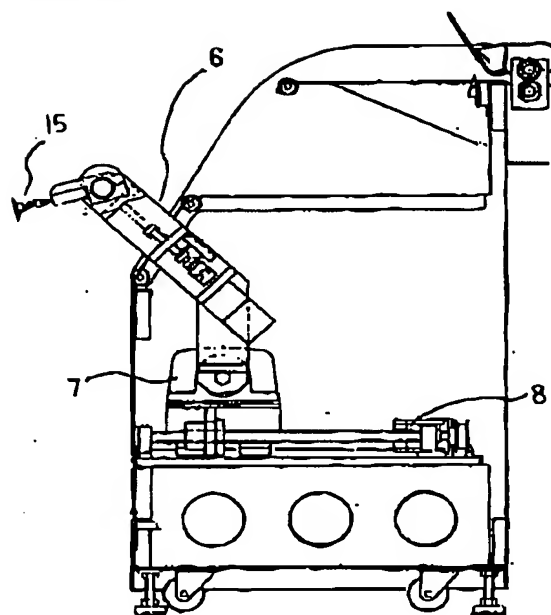
[Drawing 4]



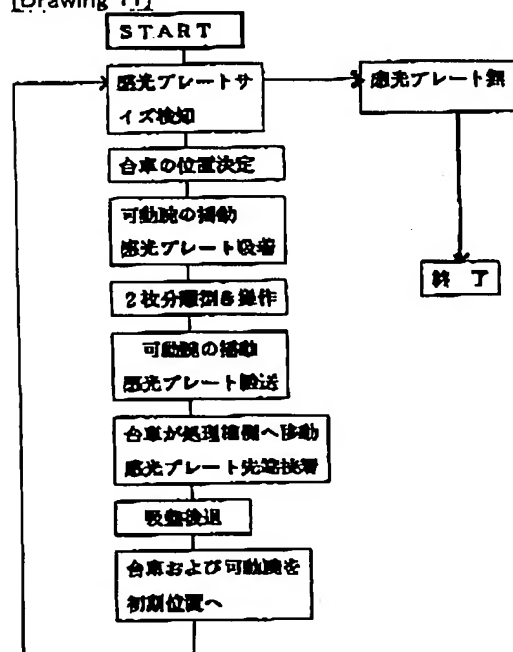
[Drawing 5]



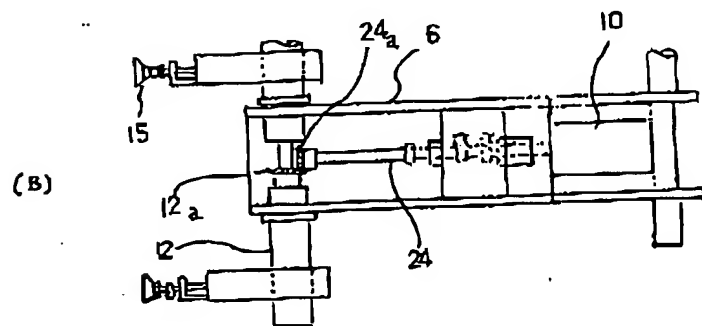
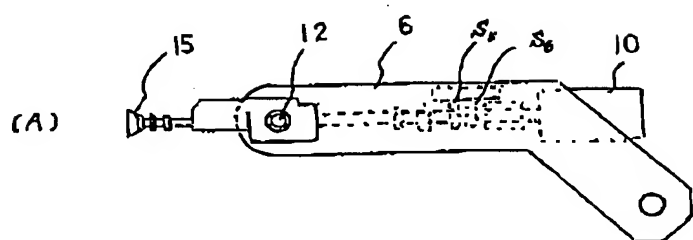
[Drawing 6]



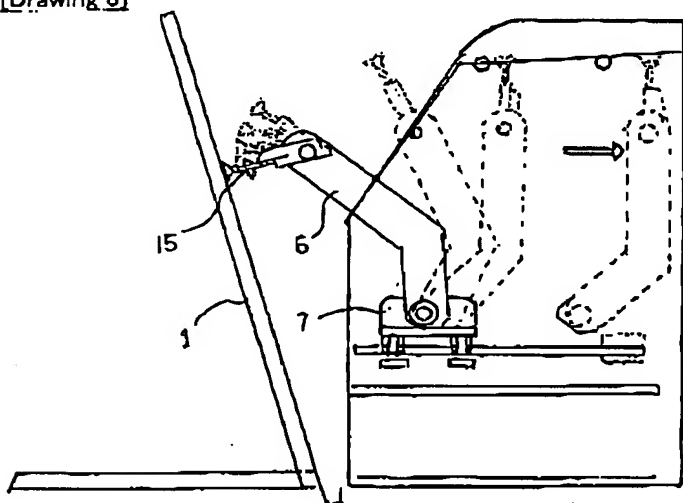
[Drawing 11]



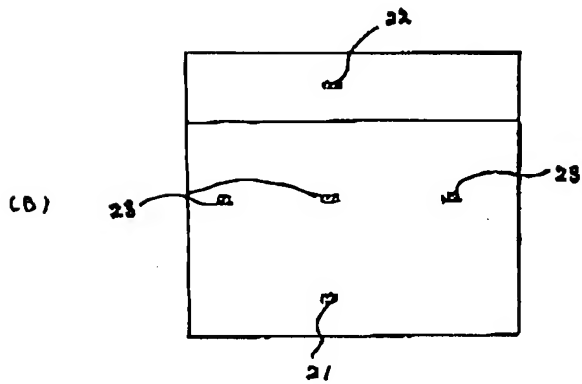
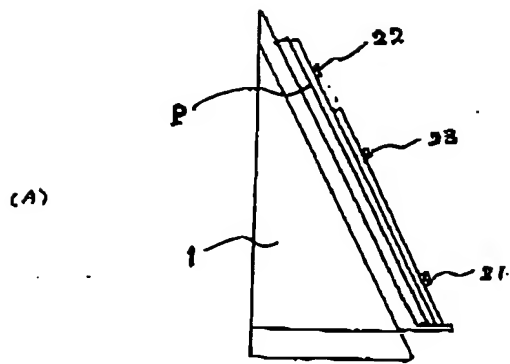
[Drawing 7]



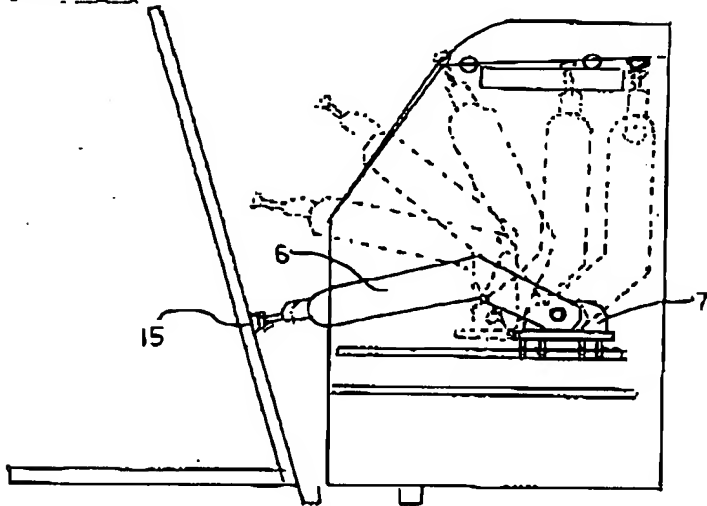
[Drawing 8]



[Drawing 10]



[Drawing 9]



[Translation done.]

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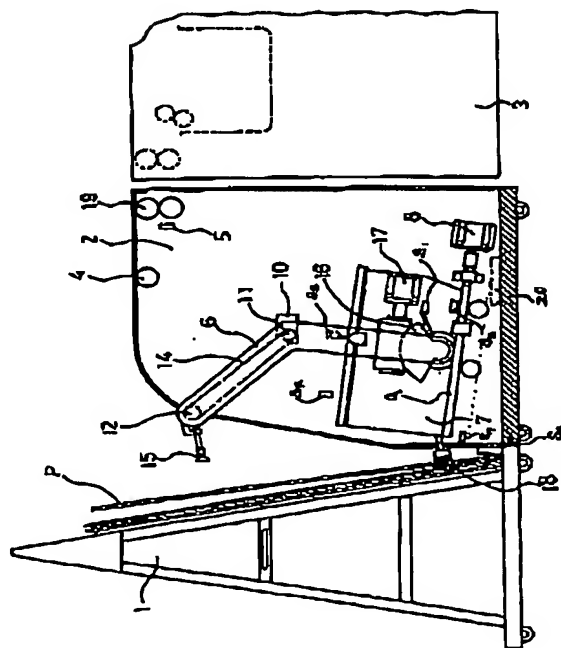
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40号

(54) 【発明の名称】 感光プレートの自動供給方法およびその装置

(57) 【要約】

【課題】 縦方向または横方向に積層した感光プレートを受盤によって吸着し、簡易な機構で上端側から確実に一枚毎供給すること。

【解決手段】 処理槽へ搬送する搬送装置に対向し、やや傾斜させてなる載置台に積載した露光済の大きさ (サイズ) の異なる複数の感光プレートの最上層の感光プレートの非感光面の上端辺近傍に、複数の吸盤を備えた吸着部材をほぼ同時に接触させてこの吸着部材を振動させ、および/または中央部の吸盤と端部分の吸盤とで吸引作用時を相異ならせて交互に接触させる分離捌き手段によって2枚目以下の感光プレートを分離捌き、この吸着部材を備えた可動腕を移動させ、最上層の感光プレートのみを前記処理槽の挿入口に搬送し、この可動腕は底板に設けたレール上を移動する台車に揺動自在に軸支されて、この台車が処理槽側に移動する構成である。



(2)

特開平9-71348

【特許請求の範囲】

1
【請求項1】感光材料を塗布した金属性の感光プレート
の像露光後、この感光プレートを積層載置位置から現
像・定着・水洗処理する処理槽等に搬送する搬送装置へ
供給するための感光プレートの自動供給装置において、
前記搬送装置の挿入側に対向して配置され、やや傾斜さ
せてなる載置台に積載している露光済の大きさ（サイ
ズ）の異なる複数の感光プレートの最上層の感光プレ
ートの非感光面の上端辺近傍に、複数の吸盤を備えた吸着
部材をほぼ同時に接触させてこの吸着部材を振動させる
か、および／または中央部の吸盤と端部分の吸盤とで吸
引作用時を相異ならせて交互に吸引させる感光プレート
の分離捌き手段によって2枚目以下の感光プレートを分
離捌き、この感光プレートを吸着した状態で、この吸着
部材を備えた可動腕を回動または平行移動させて、最上
層の感光プレートのみを上端側から、前記処理槽の挿入
口に搬送することを特徴とする感光プレートの自動供給
方法。

【請求項2】前記吸着部材の2枚目以下の感光プレート
の分離捌き手段が、前記吸着部材の吸盤の吸着面の移動
軌道に沿って最短距離往復回動の間歇的な回動作用を前
記吸着部材に付与することを特徴とする請求項1記載の
感光プレートの自動供給方法。

【請求項3】前記吸着部材の2枚分離捌き手段が、前記
吸着部材の吸盤の吸着面に垂直方向に最短距離往復振動
作用を間歇的に前記吸着部材に付与させることを特徴と
する請求項1記載の感光プレートの自動供給方法。

【請求項4】前記吸着部材の2枚分離捌き手段が、前記
吸着部材の吸盤の中央部分の吸盤と端部の吸盤とで吸引
作用時をずらせて接触吸引させ、最上層の感光プレート
に反り変形を与え、2枚目以下の感光プレート間に空気
を流入せしめることを特徴とする請求項1記載の感光プ
レートの自動供給方法。

【請求項5】前記吸着部材の吸盤の感光プレートの吸着
位置が感光プレートのサイズに関係なく、常時感光プレ
ートの上端付近に吸着できるように最上層の感光プレ
ートの大きさを検出する検出手段を配設したことを特徴と
する請求項1、2、3または請求項4記載の感光プレート
の自動供給方法。

【請求項6】前記検出手段が、感光プレートの上面に接
触する複数の導電性端子からなり、そのうちの一つは基
準導電性端子であり、この基準導電性端子は感光プレ
ートの下端中央付近に接触するように配置し、他方感光プ
レートの長さ検出用の導電性端子は感光プレートの上端
中央付近に当接する位置に配置し、感光プレートの幅検
出用の導電性端子は前記吸着部材の吸盤付近に幅方向に
所定間隔で複数配列し、感光プレートの長さや幅を検出
することを特徴とする請求項1、2、3、4または5記
載の感光プレートの自動供給方法。

【請求項7】感光材料を塗布した金属性の感光プレート

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の像露光後、この感光プレートを積層載置位置から現
像・定着・水洗処理する処理槽等に搬送する搬送装置へ
供給するための感光プレートの自動供給装置において、
処理槽へ搬送する搬送装置に対向してやや傾斜させて露
光済の感光プレートを積層載置する載置台と、
この載置台に積載した大きさ（サイズ）の異なる感光プ
レートの非感光面の上端辺近傍にほぼ同時に接触する吸
盤を備えた吸着部材と、
この吸着部材を少なくとも2個横並列して固定した回動
軸と、

10 この回動軸を回動する連結部材を介して先端に連結さ
れ、回転数または回転角を検出する複数の位置検出手段
を備え、回転自在の連動杆と、
前記回動軸の連結部材および前記連動杆等を内蔵した可
動腕の下端を回動自在に軸支し、この軸支部分を中心に
前記可動腕を揺動させる揺動部材を備え、底部に敷設し
たレール上を移動する台車と、
前記回動軸の回動を行う連結部材の回転動作、前記揺動
部材による可動腕を感光プレート側への接離動作および
20 前記揺動部材の台車を移動動作させる第1、第2および
第3の駆動手段と、

これら第1、第2および第3の駆動手段の動作を順次制
御処理する制御手段とからなり、
前記台車を移動させるとともに前記揺動部材を揺動さ
せ、前記可動腕の先端の回動軸を回動させ、前記吸着部
材の吸盤を所定位置に停止し、前記可動腕を揺動し、前
記吸着部材の吸盤を露光済感光プレートの上面に接触せ
しめ、この吸盤の吸引作用によって露光済感光プレート
の上端付近の裏面を吸着し、この吸着部材を振動させて
2枚分離捌き動作を行ったのち、前記回動軸を回転し、
感光プレートの上端縁を搬送装置の挿入口に搬送し、前
記吸着部材の吸着部材を開放し、感光プレートを処理槽
30 に搬送することを特徴とする感光プレートの自動供給装
置。

【請求項8】感光材料を塗布した金属性の感光プレート
の像露光後、この感光プレートを積層載置位置から現
像・定着・水洗処理する処理槽等に搬送する搬送装置へ
供給するための感光プレートの自動供給装置において、
処理槽へ搬送する搬送装置に対向して縦長方向にやや傾
斜させて露光済の感光プレートを積層載置する載置台
と、
この載置台に積載した大きさ（サイズ）の異なる感光プ
レートの非感光面の上端辺近傍にほぼ同時に接触する吸
盤を備えた少なくとも2個の吸着部材を固定した回動軸
の軸端部を支持した可動腕の他端を回動自在に台車に枢
支し、搬送装置内に配置した揺動部材と、
前記回動軸の回動動作、前記揺動部材による可動腕を感
光プレート側への接離動作および前記揺動部材の台車を
移動動作させる第1、第2および第3の駆動手段と、
50 この第1、第2および第3の駆動手段の動作を順次制御

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処理する制御手段とからなり、

前記第1、第2および第3の駆動手段に設けた位置検出の検出信号で前記制御手段により制御処理され、前記揺動部材によって、前記可動腕を揺動させて先端に設けた回動軸に固定している吸着部材の吸盤を感光プレートの上端縁に接触させ、吸着部材または吸盤を振動させて2枚分離剥き作用を施したのち、回動軸を回動して吸着部材によって感光プレートを移動させ、感光プレートの上端縁を処理槽側に搬送することを特徴とする感光プレートの自動供給装置。

【請求項9】前記駆動手段の一つである第1の駆動手段によって、前記揺動部材を揺動させ、その上端に回動自在に設けた回動軸の吸着部材の吸盤をほぼ同時に、前記載置台上に長さや大きさの異なる感光プレートの非感光面の上端辺近傍に接触させて吸盤によって吸着した後、前記制御手段の制御によって前記駆動手段である第2の駆動手段を制御し、吸着された感光プレート下縁が底板から離接するように前記回動軸を少なくとも2回正転（右）・逆転（左）に往復回動させ、感光プレートの1枚分離動作を行わせ、次に、回動軸を回動して吸着部材の吸着面を上側にして感光プレートを水平にし、前記駆動手段である第3の駆動手段により前記揺動部材を搬送方向に平行移動させ、回動軸に固定した吸着部材によって前記感光プレートを搬送し、この感光プレートの先端が処理槽の搬送入口に設けた搬送ローラに挿着されたとき、吸着部材の吸着作用を開放し、前記回動軸を右方向に回動し、吸着部材の吸盤を感光プレートから離反させ、前記搬送ローラにより感光プレートを処理槽へ搬送し、この搬送中に前記揺動部材は第3の駆動手段によって初期位置に戻され、次の搬送の準備を行うように揺動部材の第3の駆動手段を前記制御手段によって制御することを特徴とする請求項8記載の感光プレートの自動供給装置。

【請求項10】前記感光プレートが吸着部材の回動によって移動するとき、この感光プレートの下端付近の裏面全幅に静電気除去部材を接触させることを特徴する請求項7、8または9記載の感光プレートの自動供給装置。

【請求項11】前記揺動部材の回動軸の軸端に設けた歯車と可動腕に設けた歯振部材の歯車との間に無端帯を張架し、感光プレートが吸着部材によって吸着された後、直ちに感光プレートの搬送方向には緩速度で回動軸を右回動し、この逆方向には急速度で左回動させるアオリ運動させ、前記2枚分離動作を歯振部材で制御してなることを特徴とする請求項8、9または10記載の感光プレートの自動供給装置。

【請求項12】前記吸盤を備えた吸着部材が、内部に気体流通路を設け、気体駆動（エアシリンダ）を内蔵し、先端に設けた吸盤が吸着面に対して垂直方向に移動可能であることを特徴とする請求項7記載の感光プレートの自動供給装置。

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【請求項13】前記回轉動作、前記可動腕の揺動による感光プレートへの接離動作および台車の移動動作の前記第1、第2および第3の各駆動手段には、各動作の両端位置を検出する位置検出手段を配設したことを特徴とする請求項7または12記載の感光プレートの自動供給装置。

【請求項14】傾斜させてなる載置台上の積載せる露光済の感光プレートの最上層の感光プレート裏面に前記吸着部材の吸盤を接触させたのち、この吸着部材を振動させて2枚目以下の感光プレートを剥く、2枚分離剥き手段を設けたことを特徴とする請求項7、12記載の感光プレートの自動供給装置。

【請求項15】前記吸着部材の2枚分離剥き手段が、前記吸着部材の吸盤の吸着面の移動軌道に沿って最短距離往復振動作用を間歇的に前記吸着部材に付与するものであることを特徴とする請求項7、12、13または14記載の感光プレートの自動供給装置。

【請求項16】前記吸着部材の2枚分離剥き手段が、前記吸着部材の吸盤の吸着面に垂直方向に最短距離往復振動作用を間歇的に前記吸着部材に付与させるものであることを特徴とする請求項7、12乃至14記載の感光プレートの自動供給装置。

【請求項17】感光プレートを吸着した状態で前記吸着部材の吸盤を連続的に2〜3回吸着面に対して垂直方向に移動させて後、数秒間停止して2枚目以下の感光プレートとの間に空気を流入せしめ、再度2〜3回吸盤を振動させ、これを繰り返すことにより確実に最上層の感光プレートのみを搬送することを特徴とする請求項7、12乃至14、16記載の感光プレートの自動供給装置。

【請求項18】前記吸着部材の吸盤の感光プレートの吸着位置が感光プレートサイズに関係なく、常時感光プレートの上端付近に吸着できるように積重した最上層の感光プレートの大きさを検出する検出手段を配設したことを特徴とする請求項7、12乃至17記載の感光プレートの自動供給装置。

【請求項19】前記検出手段が、感光プレートの裏面に接触する複数の導電性端子からなり、基準導電性端子は感光プレートの下端中央付近に接触するように配置し、長さ検出用の導電性端子は感光プレートの上端中央付近に接触するように配置し、感光プレートの幅検出用の導電性端子は前記吸着部材の吸盤付近に幅方向に複数配置したものであることを特徴とする請求項7、12乃至18記載の感光プレートの自動供給装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、縦方向または横方向に立てかけて積層した感光プレートを上端側から一枚ごと確実に処理槽内に自動供給することができる感光プレートの自動供給方法およびその装置に関する。

【0002】

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【従来の技術】金属板に感光材料を塗布した印刷用感光材料を現像装置等の処理槽が配列した処理装置に連続的に搬送して処理するとき、かかる処理装置に連結して感光プレートの自動供給装置が多く使用されている。これら金属性の感光プレートは大きく、重量があるため、一般に載置台上に露光済の感光プレートを水平に積層載置し、この最上層の一枚の先端を挟持する咬爪や吸盤等を用いて処理装置の搬送口に移送させている。また、特開昭63-171128号公報に記載されているように、感光性プレートを縦方向に複数枚載置する載置台を感光プレートの搬送装置に連結し、この載置台に対向して配置した感光プレートの下端を支持する支持手段を設け、前記感光プレートの最上層の一枚の下端を吸着盤によって吸着して、前記支持部材に設けたフックに挟持させ、このフックの上昇運動によって感光性プレートを支持部材に移動載置し、この支持部材と次の感光プレートとの間に剥離部材を介在させ、支持部材を上昇させて、感光プレートの下端を押圧しながら、その上端を処理装置に搬送するものも知られている。

【0003】

【発明が解決しようとする課題】しかし、前記感光プレートを水平に載置保管するものにおいては大きな感光プレートを水平に載置するために大きな載置スペースを必要とした。また、前記縦方向に積層配置した感光プレートの下端を吸盤で吸着するために複雑な機構の剥離部材を必要とするばかりでなく、2枚目の感光プレートとの分離を確実にするために複数の吸盤の移動操作を相違させる必要があり、更に、感光プレート間に移動部材を介在させて分離作用を確実にするなど全体に構成が複雑であった。この発明の課題は、縦方向または横方向に積層した感光プレートの上端付近を吸着盤によって吸着して感光プレートを上端側から搬送装置へ簡易に搬送することができる感光プレートの自動供給方法を提供するものである。この発明の他の課題は、積層した感光プレートを挟持する把持部材を必要とせず、簡易な機構で最上層の感光プレートを確実に一枚毎に供給することができる感光プレートの自動供給装置を提供するものである。

【0004】

【課題を解決するための手段】この発明の前記課題は、感光材料を塗布した金属性の感光プレートの像露光後、この感光プレートを積層載置位置から現像・定着・水洗処理する処理槽等に搬送する搬送装置へ供給するための感光プレートの自動供給装置において、前記搬送装置の挿入側に対向して配置され、やや傾斜させてなる載置台に積載している露光済の大きさ（サイズ）の異なる複数の感光プレートの最上層の感光プレートの非感光面上端辺近傍に、複数の吸盤を備えた吸着部材をほぼ同時に接触させてこの吸着部材を振動させるか、および／または中央部の吸盤と端部分の吸盤とで吸引作用時を相異ならせて交互に吸引させる感光プレートの分離捌き手

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段によって2枚目以下の感光プレートを分離捌き、この感光プレートを吸着した状態で、この吸着部材を備えた可動腕を回動または平行移動させて、最上層の感光プレートのみを上端側から、前記処理槽の挿入口に搬送する感光プレートの自動供給方法によって達成できる。

【0005】前記搬送装置の挿入側に対向して配置され、やや傾斜させて露光済の感光プレートを積層載置する載置台と、この載置台に積載した大きさ（サイズ）の異なる感光プレートの非感光面上端辺近傍にほぼ同時に接触する吸盤を備えた吸着部材と、この吸着部材を少なくとも2個横並列して固定した回動軸と、この回動軸を回動する連結部材を介して先端に連結され、回転数を検出する複数の位置検出手段を備え、回転自在の連動杆と、前記回動軸の連結部材および前記連動杆等を内蔵した可動腕の下端を回動自在に軸支し、この軸支部分を中心に前記可動腕を揺動させる揺動部材を備え、底部に敷設したレール上を移動する台車と、前記回動軸の回動を行う連結部材の回転動作、前記揺動部材を感光プレート側への接離動作および前記揺動部材の台車を移動動作させる第1、第2および第3の駆動手段と、これら駆動手段の動作を順次制御処理する制御手段とからなり、前記第3の駆動手段によって前記台車を移動させるとともに第2の駆動手段によって前記揺動部材を揺動させ、前記可動腕の先端の回動軸を第1の駆動手段によって回動させ、前記吸着部材の吸盤を所定位置に停止し、前記可動腕を揺動し、前記吸着部材の吸盤を露光済感光プレートの裏面に接触せしめ、この吸盤によって露光済感光プレートの上端付近の裏面を吸着し、この吸着部材を振動させる分離捌き手段による2枚分離捌き動作を行ったのち、前記回動軸を回転し、感光プレートの上端を搬送装置の挿入口に搬送し、前記吸着部材の吸着部材を開放し、感光プレートを処理槽に搬送することによって達成できる。

【0006】処理槽へ搬送する搬送装置に対向して縦長方向にやや傾斜させて露光済の感光プレートを積層載置する載置台と、この載置台に積載した大きさ（サイズ）の異なる感光プレートの非感光面上端辺近傍にほぼ同時に接触する吸盤を備えた少なくとも2個の吸着部材を固定した回動軸の軸端部を支持した可動腕の他端を回動自在に台車に軸支し、搬送装置内に配置した揺動部材と、前記回動軸の回動動作、前記揺動部材を感光プレート側への接離動作および前記揺動部材の台車を移動動作させる第1、第2および第3の各駆動手段と、この各駆動手段の動作を順次制御処理する制御手段とからなり、前記各駆動手段に設けた位置検出の検出信号で前記制御手段による制御処理され、前記第3の駆動手段による前記揺動部材によって、前記可動腕を揺動させて先端に設けた回動軸に固定した吸着部材の吸盤を感光プレートの非感光面に接触させ、吸着部材を振動して2枚分離捌き作用を施したのち、回動軸を回動して吸着部材によって

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感光プレートを移動させ、感光プレートを処理槽側に搬送する構成によって達成できる。

【0007】吸盤に吸着された最上層の感光プレートの2枚目以下の感光プレートを分離する捌き手段において、前記吸着部材の振動方法とし、吸盤を吸着面に対して垂直方向に数回往復振動をおこなった後、この振動作用を数秒間休止し、この間に2枚目以下の感光プレート間に空気を流入させ、再度振動させることにより確実に分離して確実に感光プレートを一枚のみ搬送することによっても前記課題は達成できる。

【0008】また、前記揺動部材を第一の駆動手段によって揺動させ、その上端に同動自在に設けた回動軸の吸着部材の吸盤をほぼ同時に、前記載置台上に長さや大きさの異なる感光プレートの非感光面の先端付近に接触させて吸盤によって吸着した後、前記制御手段の制御によって第2の駆動手段を制御し、吸着された感光プレート下縁が底板から離接するように前記回動軸を少なくとも2回位正転(右)・逆転(左)に往復回動させ、感光プレートの1枚分離動作を行わせ、次に、回動軸を回動して吸着部材の吸着面を上側にして感光プレートを水平にし、第3の駆動手段により前記揺動部材を搬送方向に平行移動させ、回動軸に固定した吸着部材によって前記感光プレートを搬送し、この感光プレートの先端が処理槽の搬送入口に設けた搬送ローラに押着されたとき、吸着部材の吸着作用を開放し、前記回動軸を右彷徨に回動し、吸着部材の吸盤を感光プレートから離反させ、前記搬送ローラにより、感光プレートを処理槽へ搬送し、この搬送中に前記揺動部材は第3の駆動手段によって初期位置に戻され、次の搬送の準備を行うように揺動部材の第3の駆動手段を前記制御手段によって制御する構成によって前記課題は達成できる。

【0009】更に、複数の吸着部材の吸盤のうち中央部分の吸盤と端部分の吸盤とで吸引作用時をずらして感光プレートに反り変形を付与して2枚目以下の感光プレートとの間に空気を流入させ、分離捌きを確実にすることもできる。感光プレートの長さおよび横幅の大きさ(サイズ)を検出手段によって検出し、前記台車を載置台側か、処理槽側に移動することによって前記可動腕を揺動させて、前記吸着部材の吸盤の位置を移動させて種々の感光プレートの非感光面の先端付近に吸着させるようにして1個の搬送装置によって多くの感光プレートを確実に1枚のみ搬送することができ、前記課題は達成することができる。

【0010】この感光プレートの前記サイズの検出手段として基準導電性端子を感光プレートの下端中央付近に接触させるように配置し、長さを検出する導電性端子を最も長い感光プレートの上端中央付近に接触するように配置し、この上下の両導電性端子間の電気の導通性が認められたときは、前記台車の位置を載置台側に近い位置に停止せしめ、前記可動腕を揺動して、この可動腕の先

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端部分に配設した吸着部材を大きな種類の感光プレートの上端付近に吸着させ、吸着部材の回動、可動腕の揺動および台車の移動によって感光プレートの先端を処理槽の搬送入口に挿入することができる。また、上下の両導電性端子間に導通が認められないときは、前記台車を処理槽側に移動し、可動腕を揺動させて、吸着部材を短い種類の感光プレートの上端付近に吸着させ、前述と同様に可動腕を移動させて感光プレートを搬送することができる。

10 【0011】

【発明の実施の形態】この発明の感光プレートの自動供給装置(以下オートフィーダと称す)は、露光済感光プレートを水平に載置するのではなく、載置台上に縦方向または横方向に立てかけて積層載置し、この感光プレートの裏面の先端付近を複数の吸着部材をほぼ同時に吸着させて、感光プレートを上端縁を先端にして移動させるから以下のような分離機構によって確実に2枚分離が可能となる。例えば、揺動部材の先端に軸着した回動軸を左右に少なくとも2回位往復回動させて前記吸着部材を上下に往復させてアオリ動作を行うから確実に感光プレートの分離が可能であり、吸着部材によって吸着した状態で感光プレートの先端を水平にするから2枚目以下の感光プレートとの分離が容易に行うことができる。

【0012】また、吸着部材を固着した回動軸を回転させるのみで感光プレートを処理槽の搬送入口まで移動させることができるから確実に搬送入口まで感光プレートの先端を搬送することができ、かつ、感光プレートは搬送ローラによって搬送され、このとき吸着部材は感光プレート面より退避して、感光プレートは搬送ローラによって移送され、所定時間後吸着部材は回動軸の左回転によって感光プレート側に移動し、回動軸が戻り回動し、元位置に復帰する。このように構成されるから感光プレートの搬送作業が効率良く作動することになる。更に、感光プレートを吸着部材で搬送するとき感光プレート同志の摩擦による静電気の発生等の障害は、感光プレートに除電部材を接触させることにより防止することができる。

【0013】この発明の感光プレートの大きさ(サイズ)の検出手段として、感光プレートの裏面の導電性金属板に接触する基準導電性端子を配置してあるから、静電気除去部材を必要としない。また、前記サイズ検出手段により、感光プレートのサイズを検出することにより、吸盤の吸着位置を調節することにより、多くの種類のサイズの大きさに関係なく、感光プレートの上端付近を、可動腕の吸着部材で確実に吸着させることができる。

【0014】図1はこの発明にかかる感光プレートの第1の実施例の自動供給装置を備えた搬送装置の要部部分断面側面図である。図2は図1の平面図である。図3は第1の実施例の自動供給装置の拡大要部断面側面図であ

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る。図4は第1の実施例の自動供給装置の揺動部材の首振機構の説明図で、感光プレート分離動作説明図である。図5はこの発明の感光プレートと揺動部材との移動説明図である。図6はこの発明の第2の実施例の自動供給装置の要部断面側面図、図7はこの発明の第2の実施例の吸着部材および可動腕の要部側面図(A)、平面図(B)である。図8はこの発明の第2の実施例の上部位置での吸着部材および可動腕の移動軌跡を示す側面図である。図9は図8の下部位置での吸着部材および可動腕の移動軌跡を示す側面図である。図10はこの発明の自動供給装置のサイズ検出手段の説明図で、(A)は載置台の側面図、(B)は平面図である。図11はこの発明の自動供給方法の流れチャート図である。

【0015】この発明の自動供給装置(オートフィーダ)を図面に示す第1の実施例に基づき説明する。1は金属板の表面に感光材料を塗布してある感光プレートPを縦方向または横方向に立てかけ積層載置することができ傾斜面を両面に設けた載置台で、この傾斜度は10〜15度位である。2は感光プレートPの処理槽3に隣接して配置した搬送装置で、上革に複数のガイドローラ4を配設し、処理槽3の挿入口に対向した位置に一对のニップローラ19を配設してある。このニップローラ19の近傍に感光プレートPの検知センサ5が設置してある。6は揺動部材の可動腕で、この下端6aは台車7に軸支され、この台車7は第3の駆動手段である電動モータ8によって駆動され、この電動モータ8の連結したボール軸9と噛み合うネジ溝を台車7に設けてある。この可動腕6の中間部分には首振部材である第2の駆動手段であるモータ10の中間歯車11が配置されている。可動腕6の上端部に回転軸12が軸支され、この回転軸12の軸端の歯車13の可動腕6の中間歯車11との間に連鎖チェーンのような無端帯14が張架してある。

【0016】この回転軸12には感光プレートPの裏面に接触する吸着部材である吸盤15、15・が複数箇着され、この吸盤15、15・にはそれぞれ吸引管が接続されている。16は可動腕6の末端に固着した扇状の揺動用歯車で、この揺動用歯車16に噛合する螺子軸を有する第1の駆動手段である駆動モータ17によって可動腕16を載置台1側またはニップローラ19側に揺動させる。この揺動範囲はセンサS1、S2の間でそれぞれの停止位置を確認することができる。18は静電気除去ブラシで、感光プレートPが移動開始すると感光プレートPの全幅に接触するようになっている。20はモータ10、電動モータ8、駆動モータ17等の駆動を制御する制御部で、可動腕6、回転軸11および揺動用歯車16の近辺にはそれぞれの動作の臨界点にセンサS1〜S4が配置してある。

【0017】この発明の第2の実施例について図6以下の図面に基いて説明する。図6に示すように、吸着部材の吸盤15は回転軸12に吸引管を介して接続し、こ

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の回転軸12の傘歯車12aと連結部材である連動軸24の傘歯車24aとが噛合している。この連動軸24にはこの回転角を検出する検出手段S5、S6が設置されている。この検出手段S5、S6によって吸盤15の回転位置が規制されている。この連動軸24の末端は第1の駆動手段であるモータ10に連結している。可動腕6は末端が台車7に軸支されており、この台車7はレール上を第3の駆動手段である電動モータ8によって移動する。この台車7の位置はセンサS7、S8によって位置検出が行われる。この台車7は制御部20からの信号によって、載置台1上の感光プレートPの大きさ(サイズ)を検出手段である基準導電性端子21を感光プレートPの下部付近に接触させておき、上部中央付近に長さ検出用の導電性端子22が接触することによって、両端子間の導通を検出して感光プレートPの長さを検出する。

【0018】この結果、台車7の位置を載置台1側または処理槽3側に移動させて、吸着部材の位置を感光プレートPの上端付近に位置せしめ、吸盤15を感光プレートPに当接させ、吸引作用によって吸着させる。感光プレートPの横幅の大きさは幅方向に所定間隔で配置した導電性端子23、23・を感光プレートPに当接させ、基準導電性端子21と導通している導電性端子23、23・によって横幅の長さを測定して、導通していない部分の吸盤15を動作させず、導通している吸盤15、15・、すなわち、最上層の感光プレートPに接触している吸盤15・のみを作用させて吸着させる。

【0019】例えば、感光プレートPと当接している導電性端子22と基準導電性端子21との間の導通が確認されたとき、制御部20の指令に基づき電動モータ8を回動させて台車7を載置台1側の停止位置に移動させ(図8参照)、可動腕6を第2の駆動手段である駆動モータ17によって連動軸24を回転させて回転軸12を回動し、吸着部材の先端の吸盤15を感光プレートPの非感光面に当接せしめ、吸着させ、この吸盤15を吸着面に対して垂直方向にエアシリンダの作用によって複数回往復運動させる。この回数は感光プレートPの厚さによって任意に設定する。この往復運動を一端停止し、最上層の感光プレートPと2枚目以下の感光プレートPとの間に空気を流入せしめる。次に、吸盤15を再度往復運動させ、一旦休止する。これを数回位繰り返して吸着部材を回動させて感光プレートPを床面と平行な水平位置に搬送する。電動モータ8により台車7を処理槽3側にレール上移動させ、感光プレートPの先端縁が検出センサ5を通過し、ニップローラ19に挟持されたとき、吸盤15の吸引作用は開放され、下降する。台車7は初期位置に戻り、次の搬送態勢に移る。

【0020】この発明のオートフィーダの動作を説明する。図1に示す第1の実施例によれば、アルミ、亜鉛、銅等の金属板の表面に感光材料を塗布した感光プレートPが露光装置等により像様露光処理され、この露光済の

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所定サイズの感光プレートPを載置台1に縦方向に立て掛け、積層してある。この感光プレートPは種々の大きさのものが使用され、サイズの異なる感光プレートPが一般的に使用されている。従って、サイズの異なる複数枚の感光プレートが載置台1に載置してある。搬送装置2のメインスイッチを入れると、載置台1が搬送装置2の下端に設けたセンサS₆によって所定位置にあることを確認する。次に、センサS₇によって台車7の位置が検出されていることが確認され、駆動モータ17が動作して揺動用歯車16が反時計方向に回転して可動腕6の上端が感光プレートPの裏面側に揺動すると(センサS₁確認)、この可動腕6の先端に軸設した回転軸12が感光プレートP側に移動する。第2の駆動手段であるモータ10が始動し、中間歯車11がセンサS₆に検知されるまで回転し、無端帯14、歯車13を介して回転軸12が回転し、吸着部材の吸盤15、15・が吸引作用により感光プレートPの裏面上端付近に接触して吸着する。

【0021】制御部20の指令によりモータ10が始動して中間歯車11が逆転して回転し、回転軸12が図2の時計方向にゆっくり回転し、吸盤15、15・が上昇して感光プレートPが移送する。所定距離感光プレートPが移動し、中間歯車11のセンサS₆に接触するとモータ10は急速に逆転し、急速に吸盤15、15・を下降させる。感光プレートPの下端縁を載置台1の底板に衝突させる。制御部20の制御によってこの往復運動を数回繰り返して、確実に1枚の感光プレートPを吸盤15、15・に吸着させる。このとき、回転軸12にカム回転板を固着し、回転軸12の回転により感光プレートPの裏面を叩き、間歇的に叩いて振動作用を与えて、感光プレートPに振動を付与してもよい。これによって感光プレートPの2枚目以下の吸着を確実に剥離することができる。感光プレートPの捌きを行い、確実に1枚のみ吸盤15、15・で吸着し、この首振り操作が終了したら制御部20の信号によりモータ10は回転して無端帯14を介して回転軸12を図2の時計方向に回転させ、吸盤15、15・の吸着面が上向きになって感光プレートPの先端部分を水平にする。

【0022】制御部20の指令により電動モータ8が始動して台車7を処理槽3側に所定距離移動させ(この距離は制御部20において任意に設定変更可能である。)、感光プレートPの2枚目以下と分離されて感光プレートPが処理槽3側のニップローラ19へ移動する。

【0023】このとき感光プレートPの全幅にわたって下端付近に静電気除去ブラシ18が接触する。台車7を電動モータ8により所定箇所に移動し、検出センサにより停止する。駆動モータ17が始動して揺動用歯車16を介して可動腕6の上端は載置台1から離反し、回転軸12が水平移動する。吸盤15、15・も上向き状態で

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移動して感光プレートPが移送され、感光プレートPの先端がガイドローラ4を経てニップローラ19に挟持されるまで進行し、感光プレートPがニップローラ19に到達したとき、吸盤15、15・の吸引作用が開放されると同時にモータ10が動作して、中間歯車11、無端帯14、歯車13等を介して回転軸12が、更に、時計方向に回転して吸盤15、15・が感光プレート面から退避して所定位置で停止する。電動モータ8によって台車7が処理槽3側に移動して、感光プレートPの先端は処理槽3へ搬送される。

【0024】感光プレートPが所定距離搬送(タイマー等で検知)されると、駆動モータ17が動作して可動腕6および回転軸12は初期位置に戻り、モータ10が反転して中間歯車11、無端帯14、歯車13等を介して回転軸12が反時計方向に回転して吸盤15、15・が感光プレートP側に移動して初期位置に復帰する。そして次の感光プレートPの供給動作が行われる。

【0025】この発明のオートフィーダの第2の実施例について図8および図9に基づいて動作を説明する。搬送装置2のメインスイッチを入れたとき、図10(A)

(B)に示されるようにサイズ検出手段である基準導電性端子21、導電性端子22および導電性端子23、23・が載置台1上の感光プレートPの裏面の導電性の金属板に当接する。基準導電性端子21との間で導通する導電性端子22または導電性端子23、23・によって制御部20が判別して、感光プレートPのサイズを検出する。例えば、導電性端子22が基準導電性端子21と導通しているとき最上層の感光プレートPが大きいサイズであることを判別する。この検出信号に基づいて制御部20の指令により、台車7は移動して載置台1に近接して配置され、駆動モータ17が動作して揺動用歯車16を回転し、可動腕6の上端が感光プレートPの裏面側に揺動すると(センサS₁確認)、この可動腕6の先端に軸設した回転軸12が感光プレートP側に移動する。

【0026】第2の駆動手段であるモータ10が始動し、連動軸24がセンサS₆に検知されるまで回転し、傘歯車24aと傘歯車12aとを介して回転軸12が回転し、吸着部材の吸盤15、15・が吸引作用により感光プレートPの裏面上端付近に接触して吸着する。吸着部材のエアシリンダにより吸盤15、15・が吸着面に対して垂直方向に2〜3回往復動して最上層の感光プレートPを振動させ、2枚目以下の感光プレートPとの間に空気を流入させ、振動を一旦停止する。数秒後、再度振動させて確実に2枚分離捌き作用を行う。吸着部材が回転し、可動腕6が揺動して吸着した感光プレートPを上方に搬送し、電動モータ8によって台車7を移動させて感光プレートPの先端をニップローラ19に挟持させる。

【0027】前述の感光プレートPの大きさ検出手段において、基準導電性端子21と導電性端子22とが導通

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していないときは、感光プレートPのサイズが小さいほうであると判別され、制御部20の指令により電動モータ8が始動して台車7を処理槽3側に所定距離移動され、(この距離は制御部20において任意に設定変更可能である。)可動腕6は揺動作用によって揺動して感光プレートPの短い範囲の上端付近に吸着部材の吸盤15、15・を下降させて当接させる(図9参照)。この位置において、幅方向に配列した導電性端子23、23・の導通性を判別して幅方向の長さを検出する。両端部分の導電性端子23、23が導通していないときは、この部分の吸盤15、15の吸引作用を停止し、中央部分のみ吸盤15を作用させることによって無駄な吸引作用を排除することができる。前述の場合と同様に吸盤15、15・を垂直方向に振動させて2枚分離働き動作を行い、台車7を載置台1側に少し移動させながら可動腕6を揺動させるとともに回転軸12を回転させて吸着部材を回転させ、感光プレートPを水平位置にし、台車7を処理槽3側に移動させて、感光プレートPの先端をニップローラ19に挟持させる。吸盤15、15・は吸引作用は開放され、垂直に下降する。可動腕6は初期位置に復帰する。

【0028】このとき、回転軸12にカム回転板を固着し、回転軸12の回転により感光プレートPの裏面を叩き、間歇的に叩いて振動作用を与えて、感光プレートPに振動を付与してもよい。これによって感光プレートPの2枚目以下の吸着を確実に剥離することができる。

【0029】

【実施例】この発明のオートフィーダは、感光プレートの上端付近を吸着することになっているから、感光プレートのサイズが大幅に相違するものを供給する場合は可動腕および支持杆の位置を調節することにより、上端を正確に吸着出来るように設計できることは勿論である。例えば、第2の実施例のように感光プレートPの大きさを検出することによって吸着部材の吸盤に位置を変更して、多くの種類の感光プレートを搬送することができる。この感光プレートPの大きさを検出する検出装置として、複数の導電性端子を使用しているが、この導電性端子として、吸着部材の吸盤を導電性の物質で形成することにより別途に端子を設置する必要はない。例えば、幅方向の導電性端子23、23・として吸盤15、15・を使用することができる。

【0030】この発明のオートフィーダにおいて吸着部材の吸盤は所定間隔で3個採用配置しているが、この数はこれに限定されるものではない。また、吸盤によって感光プレートを吸着した後、2枚分離作業は、始め上昇移動を緩速にし、下降移動を急激にして、これを少なくとも2回位往復移動を行くことがよいがこの回数は感光プレートの材質によって任意に設計変更できる。

【0031】この発明のオートフィーダにおいて、載置台に積載した感光プレートPの2枚分離機構で、横一列に

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所定間隔で配置された吸着部材の吸盤の吸引作用を時間的にずらせることにより感光プレートに反り変形を与えて、感光プレート間に空気を流入させて分離作用を確実にすることもできる。

【0032】

【発明の効果】以上のようにこの発明の感光プレートPの自動供給方法は、感光プレートの上端付近を吸盤によって吸着するから簡易な機構で確実に感光プレートPの先端を搬送装置に搬送することができ、しかも、吸着部材による2枚分離働き作用によって確実に感光プレートPを一枚のみ搬送することができる。この2枚分離働き手段として吸盤動作によって簡易に行える。この吸着部材のアオリ作業によって簡単に感光プレートPを確実に一枚のみ吸着することができ、従来装置のような複雑な2枚搬送分離機構等などを必要としない。しかも感光プレートPの摩擦により発生する静電気も静電気除去部材により完全に除去することができ、事後の処理槽内におけるトラブル等の支障も改善することができる。また、感光プレートPのサイズ検出手段において、導電性端子を使用しているときは前記静電気除去部材は設置する必要がない。

【図面の簡単な説明】

【図1】この発明にかかる感光プレートPの自動供給装置を備えた搬送装置の要部部分断面側面図である。

【図2】この発明の自動供給装置の平面図である。

【図3】この発明自動供給装置の要部断面側面図である。

【図4】この発明の自動供給装置の揺動部材の首振機構の説明図で、感光プレートP分離動作説明図である。

【図5】この発明の感光プレートPと揺動部材との移動説明図である。

【図6】この発明の自動供給装置の第2の実施例の要部断面側面図である。

【図7】この発明の第2の実施例の吸着部材および可動腕の側面図(A)、平面図(B)である。

【図8】この発明の第2の実施例の上部位置での吸着部材および可動腕の移動軌跡を示す側面図である。

【図9】図8の下部位置での吸着部材および可動腕の移動軌跡を示す側面図である。

【図10】この発明の自動供給装置のサイズ検出手段の説明図である。

【図11】この発明の自動供給方法の流れチャート図である。

【符号の説明】

- 1 …載置台
- 2 …搬送装置
- 3 …処理槽
- 4 …ガイドローラ
- 5 …検知センサ
- 6 …可動腕
- 7 …台車

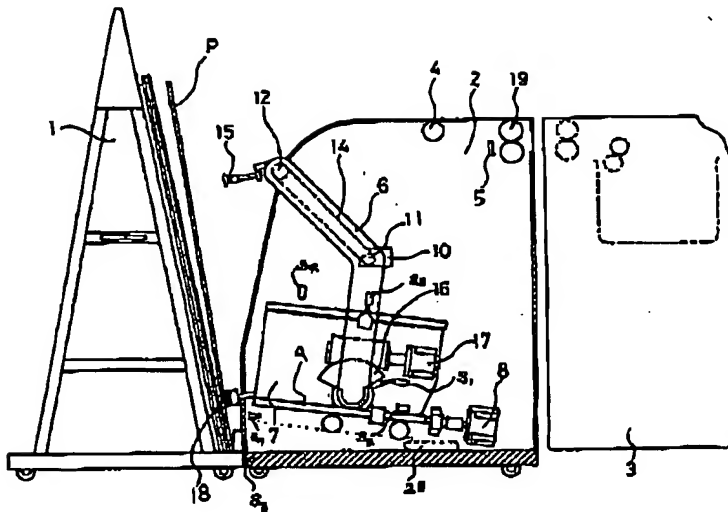
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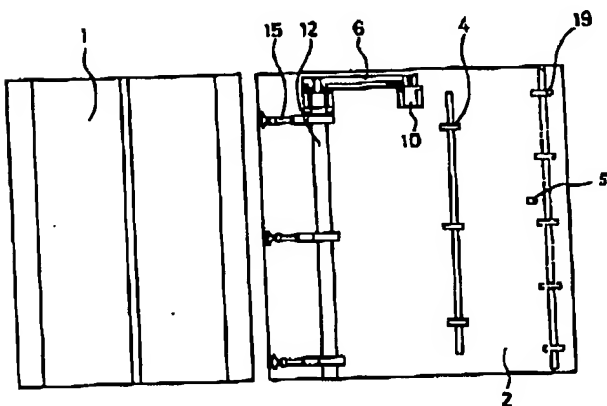
- 8 ...電動モータ
9 ...ボール軸
10 ...モータ
11 ...中間歯車
12 ...回転軸
13 ...歯車
14 ...無端帯
15 ...吸盤
16 ...揺動用歯車

- 17 ...駆動モータ
18 ...静電気除去ブラシ
19 ...ニップローラ
20 ...制御部
21 ...基準導電性端子
22 ...導電性端子 (長さ検出用)
23 ...導電性端子 (横幅検出用)
24 ...連動軸

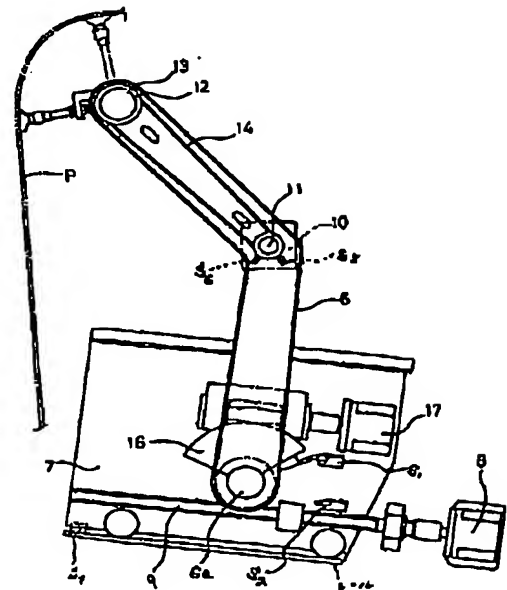
【図1】



【図2】



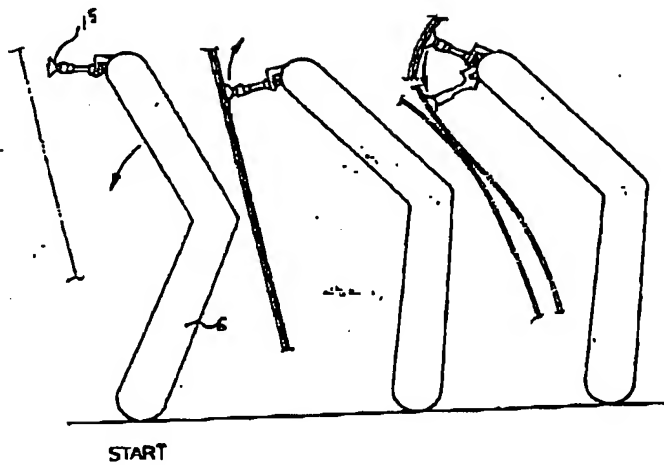
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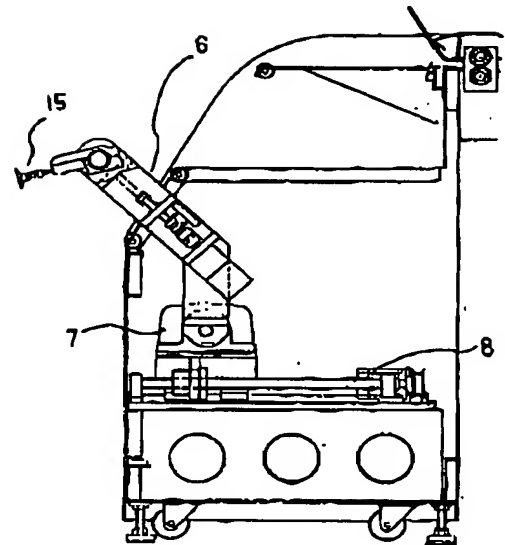
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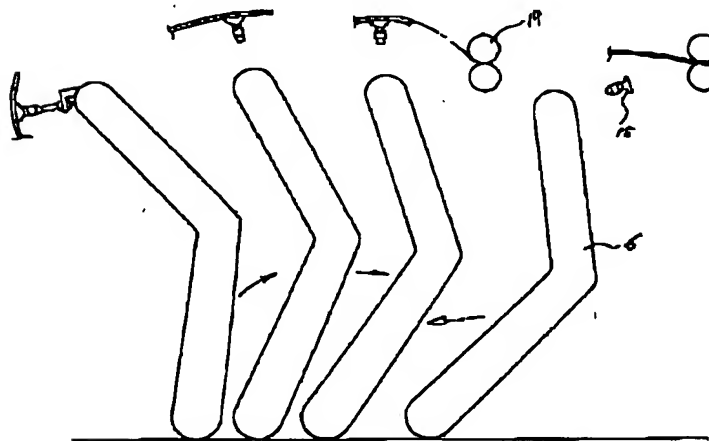
【図4】



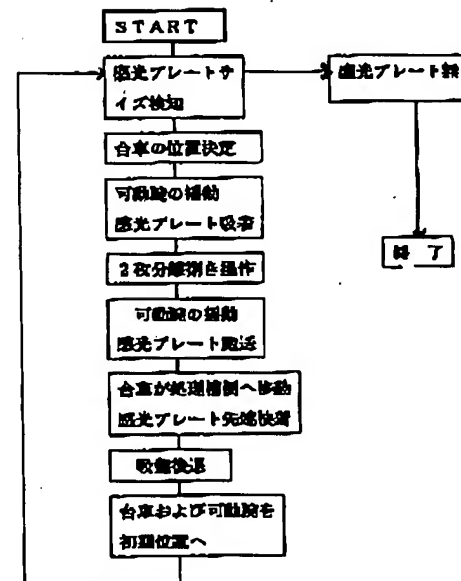
【図6】



【図5】



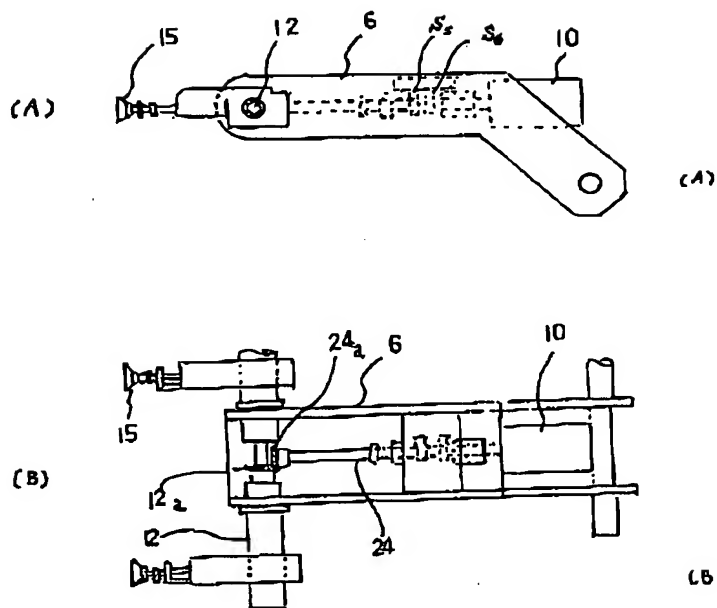
【図11】



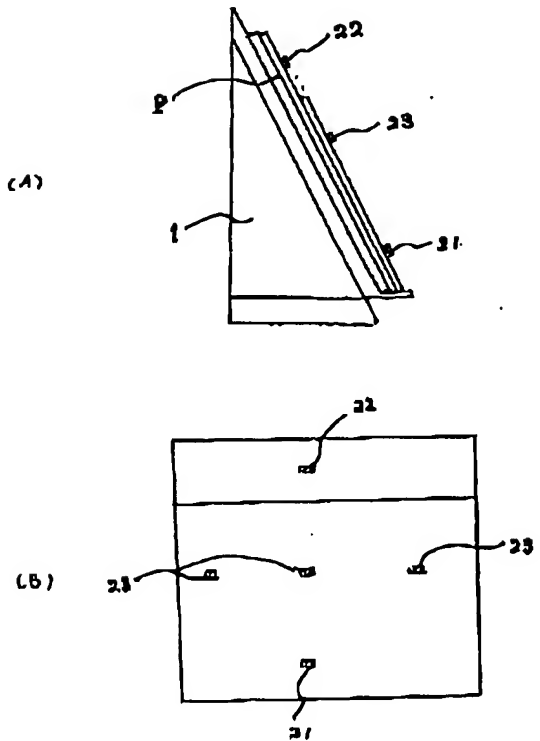
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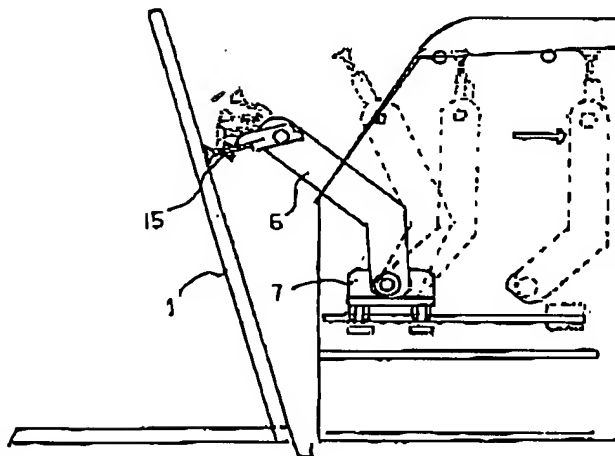
【図7】



【図10】



【図8】



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【図9】

